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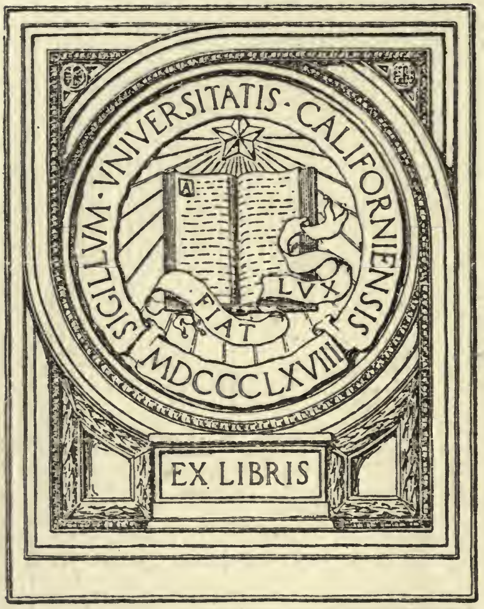

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Publications of the Red Cross Institute for
Crippled and Disabled Men
Edited by Douglas C. McMurtrie

Series II May 15, 1919 Number 8

Opportunities for the Employment of Handicapped Men in the Shoe Industry

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Bureau of Vocational Guidance
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"*The Shoe Industry*"

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Prepared by the
Bureau of Vocational Guidance
In cooperation with
Red Cross Institute for Crippled and
Disabled Men, New York

The Red Cross Institute for Crippled and Disabled Men
311 Fourth Avenue New York City

Opportunities for the Employment of Handicapped Men in the Shoe Industry

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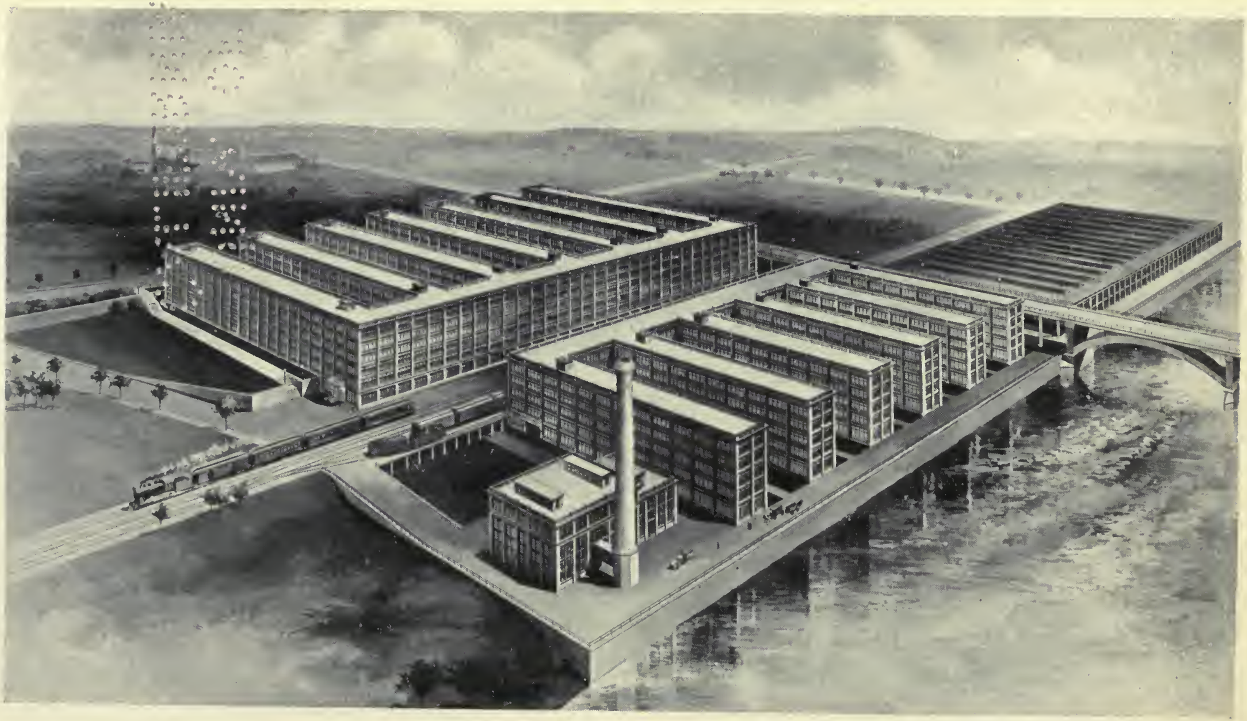

By courtesy of the McElwain Co.

A typical modern shoe factory: plant of the William H. McElwain Company, at Manchester, N. H.

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Preface

THE material embodied in this Bulletin, which is one of the series being prepared by the Harvard Bureau of Vocational Guidance for publication by the Red Cross Institute for Crippled and Disabled Men, is the result of an intensive study of the boot and shoe industry by the author through a period of years. A more complete presentation of the subject is to be found in 'The Shoe Industry', by the same writer, published by the Bureau of Vocational Guidance of Harvard University. The reader is referred to that volume for the history of shoemaking, methods in last-making and pattern-making, leather and tanning, numerous statistical tables, a glossary of shoemaking terms, and a more minute treatment of the general processes of boot and shoe manufacture.

The purpose of this Bulletin is to present a brief but adequate survey of the industry and its opportunities for handicapped workers. Extensive fresh information, therefore, has been secured from shoe manufacturers, business executives, factory superintendents, foremen, trade instructors, efficiency experts, consulting engineers, shoe machinery inventors, machine operators, and others. The conclusions and statements regarding opportunities for the handicapped which appear in the following pages have been read and approved by the same authorities. Thus, although not many handicapped persons have entered the industry as yet, and any statement must in a sense be tentative, the conclusions here presented have the weight of consensus of expert opinion.

The wages here given are neither those of 1914 nor the abnormal wages of war. They are an estimate of the probable earnings of workers in the shoe factories in peace times following the war, and are based upon information from wage authorities of high standing.

Among the many who have cooperated with the writer in the preparation of this Bulletin, special acknowledgment is due to the following:

Mr. Thomas F. Anderson, *Secretary of the New England Shoe and Leather Association*, which through its Committee on Industrial Education has approved and furthered the work.

Mr. J. B. Hadaway, *Consulting Engineer of the United Shoe Machinery Corporation*, who has supplied the illustrations of the Bulletin and aided in other ways.

Professor George E. Johnson, *of the Division of Education of Harvard University*, who has visited shoe factories in checking up material and has also contributed valuable suggestions.

Frederick J. Allen

Harvard University
November, 1918

I. The Employment of Handicapped Men in the Shoe Industry

Many of the minor processes of shoe manufacture and a considerable number of the major processes can be performed by handicapped men. The industry offers numerous opportunities for such workers to earn a fair living or even high wages and salaries. Its 1400 factories are established in all sections of the country, and each factory employs hundreds or thousands of operatives. The place, moreover, of the industry is among the great staples whose products are in ever increasing demand. Such industries must have workers, and must, if necessary, modify their processes to the abilities and condition of the workers who will be returned to employment after the war.

Shoe manufacturers are ready to employ men who return with disabilities. If such men have formerly been employed in the industry they can enter it again the more easily; if they have not done shoe work, they can learn some part of it in a comparatively brief time. The employer in the great shoe centers especially will welcome the returned soldier, who will have on the whole good mental ability. It is now necessary in these places to hire considerable alien help, which has only an economic interest in the service it performs. Furthermore, the employment of handicapped men in the shoe factory will lessen the increasing danger of an over-employment of women in the harder and more wearing divisions of the occupation.

The view of the manufacturer is well expressed in the following statement by the superintendent of one of the great factories in the vicinity of Boston, when the investigation of opportunities for the handicapped was going on in this factory:

> Work here depends on the man more than on freedom from handicap. A person willing to take hold and learn may do something with almost any handicap. An operative here who loses several fingers or a thumb may keep his place on almost any job. So one blind in one eye may still work; those deaf and dumb may work here successfully. We have this morning hired four inexperienced men who are both deaf and dumb. They will be put upon machines and trained as shoe workers.

Of specific disabilities it is necessary here to speak but briefly. Loss of legs will not incapacitate a man in the industry. He may work at many operations sitting. Plans are now being considered to construct seats and benches for some of the heavy shoe machines at which the operator now stands. The great problem will be to enable the man who has lost one or both hands or arms to operate shoe machines or do hand processes in the factory. A man of general strength and health who has almost any injury except in hands and arms may become a shoe operator. Manufacturers and inventors of shoe machinery are now considering methods of adapting shoe machines to handicapped operators by means of mechanical devices, air pressure, and electrical devices. Where now a foot pressure of eighty or one hundred pounds is used on the treadle of a heavy machine, by possible and contemplated improvements this pressure may be reduced ninety per cent., or the machine may even be operated by touching an electric button. Mr. J. B. Hadaway, consulting engineer for the United Shoe Machinery Corporation, made the following wisely conservative statement, expressly for this section of the Bulletin:

> I think it possible in time to so arrange the machines that the difficulties which would be experienced by operators with crippled limbs will be partially overcome.

This is the statement of a leading authority in a great corporation which manufactures and leases shoe machinery for the bulk of the industry in this country today.

The conservative point of view upon the employment of handicapped men in the shoe industry may properly be presented here, that we may the better understand the industry and more intelligently estimate its opportunities for workers who have disabilities of any kind. Shoe manufacture is highly specialized and its operations are mainly performed on standard machines. The best paying operations are upon machines that call for the full strength of a person standing while at work, and require two good hands and two legs, healthy lungs, and strong chest muscles. There is also a great deal of moving about at most jobs, to do one's own work and pass it to the next operator, and quickness of movement and speed of machine are necessary for profitable earnings for the individual worker and for a satisfactory output in a factory department. It is just as necessary for a piece worker to work fast as for a day worker, since he must keep up to the rate of speed required by workers associated with him. All shoe parts being worked upon pass through one room after another on scheduled time, and no operative can be allowed to fall behind others. The shoe factory as a whole is no more efficient than the weakest link in the chain of workers.

As most operations are paid by the piece, the handicapped worker might receive lower wages, since no factory would increase its rate. It might become necessary, then, in part, to employ handicapped persons upon the less skilled operations now performed by women and girls, or boys, at wages paid to these workers. This would displace such workers in a degree, even if shoe manufacturers were willing to make the change; but manufacturers prefer women, girls, and boys for most of the work which they now do on account of their skill of hand, quickness, or steady application to their work. Women, in particular, are being employed in increasing numbers in the shoe factory upon the processes previously performed by men. In general, the output of these women is proving greater than that of men formerly in the same processes, and a return to the earlier relative numbers of the sexes in the industry is not to be expected.

Mr. Sidney W. Winslow, Vice-president of the United Shoe Machinery Corporation, makes the following statement:

> Ninety per cent. of our machinery calls for the use of both hands in holding the shoe up to the machinery in such a position that the machinery may operate upon the shoe step by step along the contour of the shoe, which means that the operator has to turn the shoe by hand and needs both hands to do so. This would, of course, prevent most of the hand cripples from being able to use 90 per cent. of our machinery.
>
> At most of our machines the operators stand while running them. Our Experimental Department has been going through our machines thoroughly with the idea of arranging that the operator may sit and operate these machines, having in mind the possibility of woman labor. This, of course, would make it possible for the leg cripples to run these machines.

These machines represent investments of millions of dollars and priceless patents. In some cases there are thirty or forty patents on a single machine. Changes in the machines, therefore, will come very slowly, and generally only in the line of the perfection of a process.

Certain conclusions in regard to the problem of the employment of handicapped workers in the shoe industry are here presented:

1. Opportunities exist to a considerable degree in the major and to a large degree in the minor factory processes and in shoe repairing.

2. In the present scarcity of intelligent labor, employers will welcome the handicapped worker who desires to enter the shoe factory.

3. Leg handicap will not incapacitate a person for shoe work. The man with one artificial leg may stand at a machine; one with both legs gone or artificial may work sitting, especially after projected changes in machinery.

4. The main problem is one of hands and arms. Most of the processes in shoe manufacture require two goods hands. Passing from early hand shoemaking to present machine shoemaking only adds intricacy to processes.

5. Defective sight and serious bodily injury constitute decided handicaps.

6. Minor injuries and the loss of several fingers are practically negligible handicaps.

7. Shoe machinery is standardized. The main processes are fixed and demand workers who are vigorous, active, and capable of endurance.

8. Shoe machinery is based upon thousands of costly patents and represents millions of dollars in investments. Changes for any one particular class of workers are likely to come slowly.

9. Handicapped men should be well trained and placed on shoe processes where they will be 100 per cent. efficient as compared to other operators. They can expect to remain in the shoe factory permanently only on this basis.

The specific kinds of disabilities with which this Bulletin, like others in the series, deals, are the following:

1. Legs
2. Arms
3. Hands
4. Fingers
5. Defective sight
6. Defective hearing
7. Nervous disorders
8. Trunk disabilities
9. Pulmonary diseases
10. Heart diseases
11. Hernia
12. Skin diseases
13. Paralysis
14. Ankylosis
15. Other handicaps

The Early American Shoemaker

UNIV. OF CALIFORNIA

II. A Modern Shoe Factory

It is a far step from the ten-by-twelve, one-story shoemaker's shop of the middle of the last century to the great concrete structure which houses the modern shoe factory. True, there are many wooden factories in our older shoe centers, but they were built twenty, or thirty, or forty years ago—before the age of steel and concrete. American shoe manufacturers are now erecting the finest and largest shoe factories in the world, profiting by the developments in building construction in the Old World and in the New.

The shoe manufacturer seeks a locality that is accessible by railway, on or near some main line of traffic, that he may bring in his raw materials and distribute the manufactured product with as little cost and delay as possible. It is an advertisement to him to be located in a well-known industrial center. Frequently he is granted exemption from local taxation as an inducement to enter a town.

The securing of workers constitutes the greatest problem of the manufacturer. He seeks a community out of which he may secure factory employees, without competing with other industries to his disadvantage in the scale of wages. The older and leading shoe towns, therefore, like Lynn and Brockton, Mass., are essentially one-industry towns. The shoe factory in the large city obtains employees from the great number of industrial workers to be found there, and suffers from the mobility of labor. The factory in the small town or country community draws its workers from the rural districts and profits by the inertia of labor. And the large shoe factory continually attracts operatives who have learned their trade in the smaller factory.

Let us, then, view a typical modern shoe factory in an industrial community. We find it upon a main or spur railway line, and upon one or more public thoroughfares, convenient to traffic and accessible to employees. At the rear of the building is a sizable park, with shade trees, flowers, shrubbery, and settees for employees during rest hours. A club house and athletic field for male employees are among the features which make industrial employment attractive to workmen. All these advantages, with others maintained in the factory itself, contribute to the home feeling and factory pride and spirit of the employees. They create solidarity in factory life. They signify the mutual getting together of employer and worker. They make out of industry a means of social and personal growth.

Turning to the factory itself, we observe its massive, yet window-covered structure. It consists of a steel frame covered with concrete, the gray garb of modern industry. This building has the typical, standardized form that has been developed in the shoe industry. Light is the most important consideration. The width of the building is limited to about fifty feet, so that there may be plenty of light along the middle of each room. This plan allows ample space for the economic placing of machinery. In this factory no space is lost. Some shoe factories in European countries have but one story with glass roof, so that the light falls clearly upon all parts of the floor, thus necessitating extensive ground space. Our American building, economizing ground space, gets light from the sides, but usually has a special system of windows in the roof for the benefit of the upper floor.

This typical shoe factory is a single building about three hundred feet long and four stories in height. Sometimes there are wings at the ends of the main building of the same height and width as the main structure. The length varies from two hundred feet up to several hundred and some factory systems are as much as a quarter or half-mile long. Such large plants employ four or five thousand people, and turn out fifteen to twenty thousand pairs of shoes a day. Some large factories have seven or eight floors, but usually because of lack of ground space or because of having been built before the standard plan was fixed.

The power plant is installed in a one-story building on one side of the factory. Steam is generally used to generate power and furnish heat, and electricity for lighting purposes. In some factories electricity furnishes the motive power also. This building is equipped with an automatic alarm, freight and passenger elevators, stairways, and fire escapes. It has an extensive locker system, and the latest sanitary equipment throughout. An exhaust fan system is used to draw the dust and dirt from the abrasive and trimming machines used in the different departments. This dust material is conveyed to a receptacle near the power house, where it is burned in the furnace.

The four-floor system of the factory is found to be the most convenient for the sequence of processes in manufacture. The four floors provide space for the six major departments of manufacture and for the business offices. The sole leather department, which prepares the bottom parts of the shoe, occupies the first or basement floor. The upper leather and stitching departments occupy the fourth or upper floor, where it is always possible to obtain plenty of light. In these departments the leather upper parts and linings of the shoe are cut out and sewed together and made ready for attaching the bottom. The making or bottoming department uses most of the third floor. Here the sole leather parts and leather tops and linings are brought together and the shoe is made ready for finishing.

The finishing, packing, and shipping departments are upon the second floor. All of these divisions of the factory are described at length in the sections which follow. The business offices are usually divided between the second and third floors, while the factory offices are associated with factory rooms when possible.

A very large shoe manufacturing company may have a system of buildings grouped about a common center, which may be a separate administration building or the oldest or main factory building. In such a system the sole leather department usually occupies an entire building, preparing sole leather parts for the other manufacturing departments. Another building is usually given up entirely to making men's shoes, another to women's shoes, and so on, according to the special lines followed by the concern. There may also be a box factory, saw mill, printing plant, or other subsidiary department attached to the group of buildings. In some cases a large concern has central offices, or a central factory, in one locality, and the separate factories in other localities.

It remains to speak of the neighborhood of the shoe manufacturing plant. This neighborhood tends to become a factory community, as time passes. Shoe operatives with families wish to live near their work, and frequently several members of a family work in the same factory. Car fares then become an item of importance. The family accordingly lives near enough to the factory to walk back and forth and to come home for lunch at noon time. On the other hand the manufacturer prefers to hire those who live near by, as they can the better be depended upon to remain steadily and permanently in his employ.

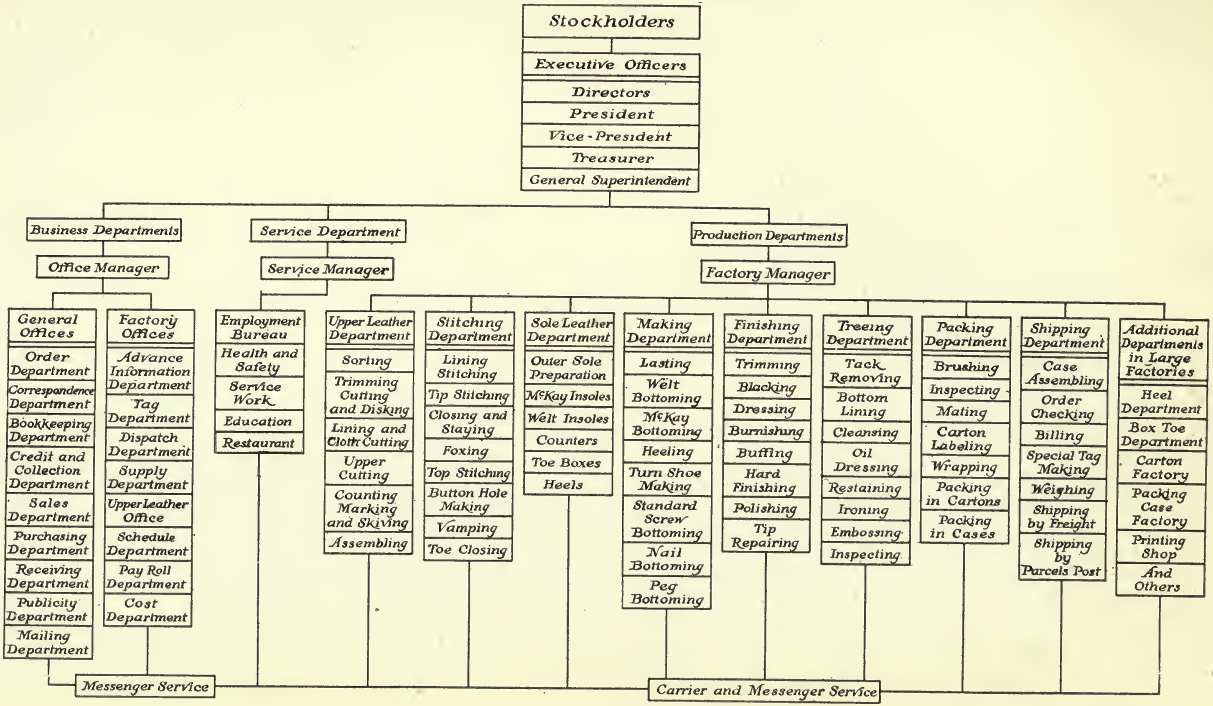
III. The Magnitude of the Shoe Industry Today

The growth of the manufacture of boots and shoes in this country has been remarkable. The greatest gain has taken place within the last twenty-five years, or since the invention and general use of the more important shoe machines. There are now about 1,400 factories making boots and shoes only, and about 600 factories manufacturing allied products, in more than thirty states of the Union. The leading states in their order are Massachusetts, Missouri, New York, New Hampshire, Ohio, Pennsylvania, and Illinois. The capital invested in the entire industry is now in the neighborhood of $500,000,000, and the number of employees in the factories is probably about 275,000. Boston is the leading center of the world in the shoe and leather trade; Chicago, in trade in untanned hides. Lynn, the first home of the industry in this country, was long the leading city in the manufacture of shoes and shoe material. It now leads in the manufacture of women's shoes. Brockton, Mass., stands first in the manufacture of men's footwear. Other cities in the order of magnitude of the production of shoes are St. Louis, Mo., Haverhill, Mass., Boston, New York, Manchester, N. H., Cincinnati, Rochester, N. Y., and Chicago.

Before the war $100,000,000 was spent annually in this country in shoe repairing, which has grown rapidly into a machine industry. It is now estimated that the yearly earnings of this industry are fully $300,000,000, in addition to an extensive sale of shoe findings.

The exportation of American-made shoes has come within the last twenty years. The United States is not only leading the world in shoe manufacture, but is finding markets increasingly in all countries. At the opening of the European War we were exporting shoes to over ninety foreign countries. In the years of peace following the war, with the remarkable revival of our merchant marine, our foreign trade in all lines will surpass all former bounds and ambitions.

CHART of ORGANIZATION in the SHOE INDUSTRY



IV. The Organization of a Shoe Factory

A modern shoe factory has three lines of business activities associated with it—executive control, maintenance of business, and maintenance of manufacture. Service management, which includes the recruiting, training, promotion, and care of the health and personal welfare of employees, is usually grouped with the three major divisions, but in a sense is independent of them. The chart on page 27 presents under 'Executive Officers' and 'Business Departments' the activities of the business side of a modern shoe factory. From fifteen to twenty per cent., or nearly one-fifth of the persons connected with the shoe industry, are employed in the work of these divisions.

The usual executive officers down through the list are: Directors, president, vice-president, treasurer, and superintendent or general manager. The functions and duties of the executive officers and their assistants in shoe manufacture are the same as are found in the general business world. They originate and control plans and policies for the conduct of business and manufacture.

The activities of the general offices reach out into the world of trade. They maintain the business relations of the factory. They handle the orders received from retail dealers and agents, attend to correspondence and bookkeeping, purchase and care for material, advertise and sell manufactured goods, determine credits, and make collections.

The factory offices are concerned closely with manufacture, touching the factory at every department. They are usually separate from the general offices and placed in or near the departments of the factory where work is actually done. They take charge of tags made from the orders received by the order department and follow them through the factory. They provide a schedule of the time in which shoes shall be made or passed from room to room. Briefly, they maintain control over manufacture in the factory.

The production departments are divided into six leading general divisions in the modern shoe factory, as follows: Upper leather department, stitching department, sole leather department, making department, finishing department, and the treeing, packing, and shipping department. These are each minutely subdivided into factory rooms, sections, or departments. In large factories we find numerous additional divisions, such as heel department, box toe department, and box factory.

Other names are sometimes used for some of these divisions. For instance, the stitching department is sometimes called the fitting department; the sole leather department, the stock-fitting division; and the making department, the bottoming department. For the sake of brevity in speaking, the word 'room' is very generally used in a shoe factory for department. The divisions of factory manufacture appear in the accompanying diagram under the heading 'Production Departments'.

The organization of the shoe factory has become standardized with the great development of the industry in recent years, and the accompanying chart presents this standard form of organization. Here appear, in their natural sequence, the divisions of executive control, business, employment service, and factory production. The subdivisions in each section are arranged in the order of the work done or of the special processes of manufacture.

V. Methods in Shoe Manufacture

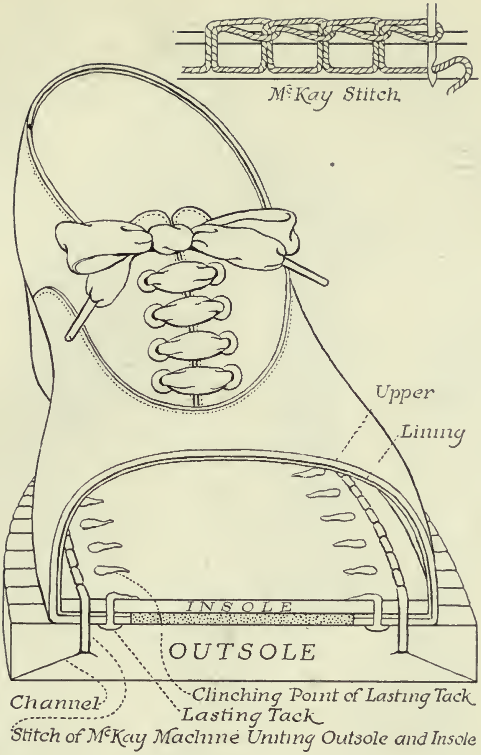
The various methods used in manufacturing shoes are a result of the introduction of machinery into the industry. Before the introduction of shoe machinery, all sewing upon shoes, both the fastening of the bottom of the shoe to the upper as well as fastening together the parts of the upper, was done by hand. Indeed, it was the early custom in shoe factories to allow people to take parts of shoes from the factory to their homes for hand stitching. The great break between shoemaking as a hand industry and shoemaking as a machine industry came with the period of the Civil War. The chief difficulty in the making of shoes and some of the early important improvements had to do with the attaching of the sole to the upper. From the methods used in fastening together the sole and the upper of the shoe we have the following divisions, each indicating both a kind of shoe and a special method of manufacture:

The Goodyear Welt
The McKay
The Turned
The Standard Screw
The Pegged
The Nailed

Most factories confined themselves to making one or two kinds of footwear, or to using one or two of these methods in boot and shoe manufacture. One manufacturer is known as a maker of Goodyear welt shoes, another of McKay shoes, another of nailed shoes, and so on. The lighter kinds of shoes, those worn by men in civilian life and those worn by women and children, are the Goodyear welt, McKay, and turned. The heavier grades, especially those made for outdoor wear by farmers, fishermen, and soldiers in some countries are made by the pegged and standard screw methods. The McKay method, by which the bottom of the shoe is sewed to the upper, the stitches passing directly through both outer and inner soles, has been used very extensively in the medium weight and cheaper shoes for many kinds of wear. The Goodyear welt has been used more and more widely for the medium and better grades and is the process of leading importance at the present time. By this process the sole of the shoe is sewed to the upper by means of a welt, making a flexible, comfortable shoe that may be easily and frequently repaired. The turned shoe method is used in making fine shoes and slippers for women and children. The shoe, which must be of flexible leather, is made wrong side out and then turned right side out. Wooden pegs and nails were long in use, leading to the method of the 'standard screw', in which the nail has become a piece of wire with screw threads upon it.

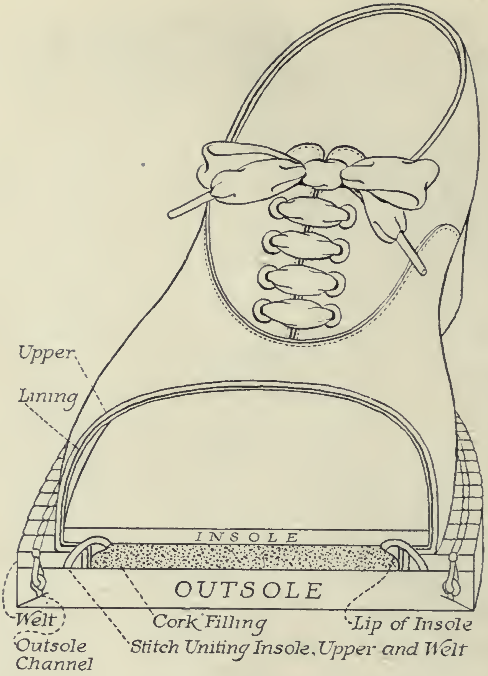
Although the exact figures are not available, it is probable that at the present time the machine or hand-welt method produces about forty per cent. of the boots and shoes made in this country; the McKay method, about thirty-five per cent.; the turned method about fifteen per cent.; the standard screw and nailed methods, about eight per cent.; and the wooden pegged, about two per cent. We shall consider all these kinds of shoes and methods of manufacture frequently in the following pages.

The Goodyear welt method will interest us most because of its increasing importance in industry. It may be regarded as typically representative of American shoemaking. Various parts of the Goodyear welt shoe are the same as in most other shoes, aside from the welt. As seen in the process of making, they are the following:


Mc Kay Stitch
Upper
Lining
INSOLE
OUTSOLE
Channel
Clinching Point of Lasting Tack
Lasting Tack
Stitch of McKay Machine Uniting Outsole and Insole

Cross section of a McKay sewed shoe

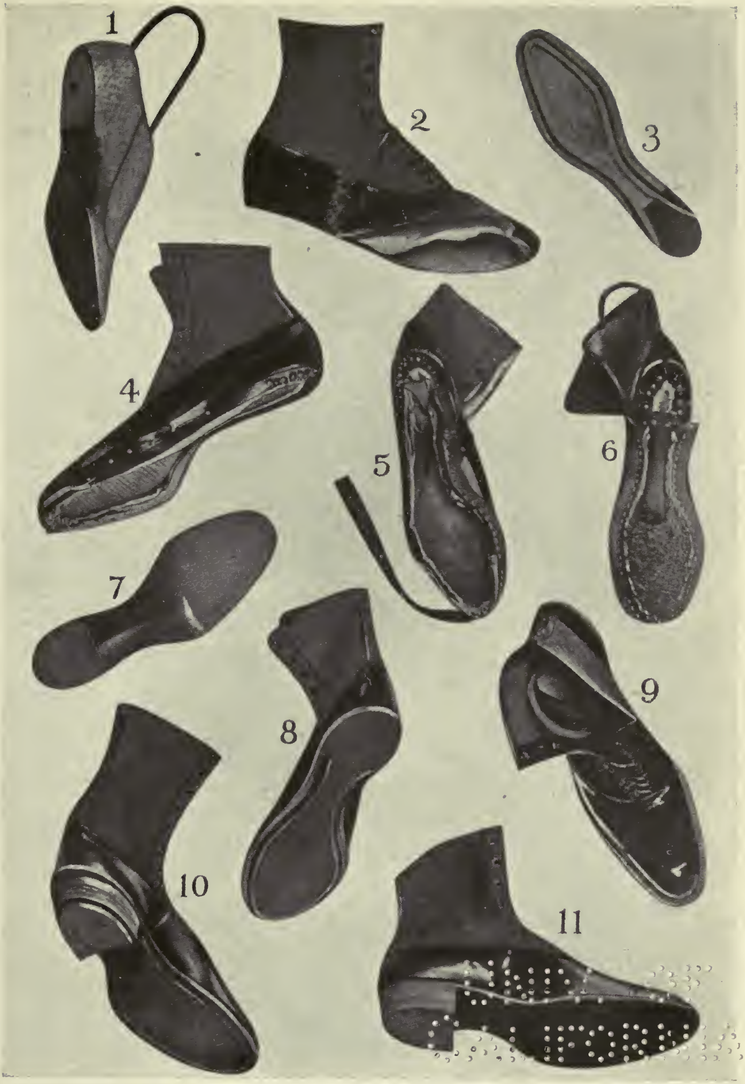
While this is a sewed shoe, it differs radically from those made by the Goodyear welt process, inasmuch as the lasting tacks and a line of stitches appear inside. It is the method very generally employed in making the cheap and medium grades of shoes.



Cross section of a Goodyear welt shoe

This diagram shows the ingenious method employed in constructing this now widely worn type of shoe, which is perfectly smooth inside. The tacks used in lasting are all withdrawn, and a machine with a curved needle sews the welt and shoe upper to the insole without going inside the shoe. The heavy outsole is then stitched to the welt. The thread used is of the strongest linen and thoroughly waxed. It makes the most durable and comfortable type of shoe, and one on which the outsole can readily be renewed.

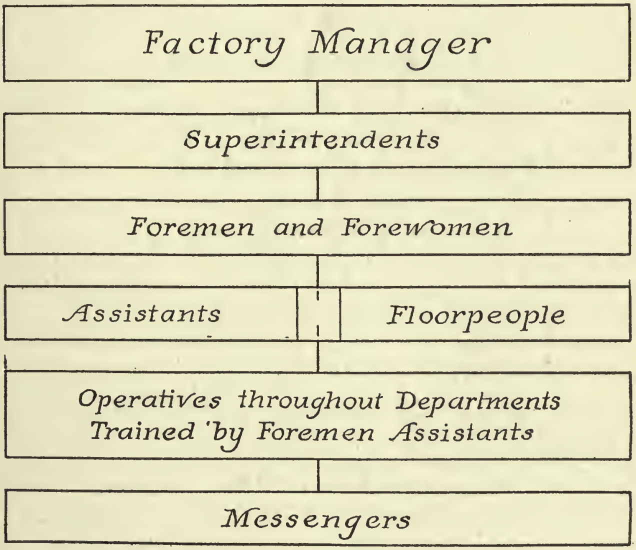
The excellent qualities and popularity of the welt shoe have led to many imitations of it in the McKay method.



A Goodyear welt shoe in the different stages of manufacture

1. The last.
2. The upper.
3. The sole.
4. The shoe lasted and ready for sewing on the welt.
5. The welt partially sewed on.
6. The welt entirely sewed on and the shoe ready for laying the outsole.
7. The outsole.
8. The shoe with the outsole laid and rounded, and the channel lip turned up for stitching.
9. The shoe with the sole stitched on.
10. The shoe with the heel attached.
11. The shoe with the heel trimmed and ready for finishing.

CHART of FACTORY MANAGEMENT



VI. The Upper Leather Department

In this and the following sections are presented in detail the nature of the departments of shoe manufacture, the actual factory processes in them, and their opportunities for employment for handicapped men.

Nearly all shoe workers are restricted to running particular single machines or doing other work of a single kind. In a few cases, related or consecutive processes may be combined in one process or performed on a single machine. In every case the details of manufacture are of the highest importance, and every operator must observe exactly the specifications of each lot of shoes passing through his hands.

The making of a pair of shoes begins simultaneously in the cutting room of the upper leather division and in the sole leather division of the factory. When an order is received in the order department, records are made of all the specifications for the shoes which are to be made to fill the order. These specifications must be followed throughout the factory, and the shoes when made must conform to them. Tags bearing the number of the order and details regarding the shoe upper are sent to the foreman of the cutting room. Other tags, bearing details about the sole leather to be used, are sent to the foreman of the sole leather room. A third set of tags goes to the foreman of the making room where are brought together the uppers, prepared in the cutting and stitching rooms, and the bottoms, which have been prepared in the sole leather room.

Day sheets, also, are prepared by the dispatch office, showing accurately the details of each lot of shoes passing into a factory on a given day and the scheduled time when the last lot should pass a given point. These sheets go to the various factory rooms as guides and records of each day's work. The use of the day sheet has greatly promoted efficient methods in the shoe factory.

The Upper Leather Department and Its Divisions. The upper leather department is that division of the factory in which all the parts of the shoe upper, both leather tops, linings, and trimmings, are prepared and assembled for the stitching room. Following are the divisions of the department:

1. Sorting Department
2. Trimming, Cutting, and Dinking Department.
3. Lining and Cloth Cutting Department.
4. Upper Cutting Department.
5. Counting, Marking, and Skiving Department.
6. Assembling Department.

In the sorting department are stored, measured, and sorted the leather and other materials that enter into the top of a shoe. It has three divisions—leather, linings, and trimmings, which are handled separately.

The measuring of upper leather precedes sorting, as the square feet and inches of each piece must be known. The operator takes up a skin, unfolds it, lays it out flat upon the table top of the machine, and causes it to pass into the rollers of the measuring machine, which records the exact number of square inches in it. He must be very careful and trustworthy, able to move about freely in taking up and unfolding the skin, and have the full use of his hands. A man with a slight handicap, who had formerly done this work, might still do it. An inexperienced man with serious handicap of hands, legs, abdomen, or sight could not well become a leather measurer. And as there are only one or two such positions in a factory the opportunity to learn would not be given to any but a most capable person.

A person learns leather measuring by assisting at the machine. The pay ranges from $25 to $40 a week. The work offers no particular line of promotion, being in itself permanent for the one who is adapted to it.

The positions in a sorting room are usually as follows:

1. The Inspector.
2. The Head Sorter.
3. Leather and Lining Sorters.
4. Weighers.
5. Men who select the sorted lots of leather according to the cutters' tags.
6. Girls who figure the allowances of leather called for by the tags and keep the cutters' accounts.

The duties of persons in these positions are obvious. The inspector examines the material selected by the sorters to see that it is rightly chosen. He must have intimate knowledge of leather and fabrics and considerable experience himself in sorting. The head sorter directs the work of his assistant sorters, and helps them when necessary. The weighers and the men who put up the jobs called for by the cutters' tags must be careful and accurate, so that leather may be used according to specifications, without material loss in manufacture. They need not be skilled in any other particular line of work.

The Leather Sorter. The cutting room tags call for special kinds of leather for the various lots of shoes that are to be made in a factory. The sorter, who uses these tags in the upper leather room, must be able to judge by experience exactly the quantity and quality of leather required to cut each order. He tests the quality of each skin by doubling it along the back and passing his fingers along the folded edge. When he has selected enough skins for each lot of shoes, he rolls them into a bundle and attaches the proper ticket to indicate their use. He must be familiar with all the kinds of upper leather used, which are about two hundred at the present time. He must have served several years' apprenticeship as a cutter, so as to learn the kinds, the feel, and the cutting value of leather. Sometimes upper leather is sorted and weighed into lots, so as to be ready for orders from the cutting room.

The Lining Sorter. The various fabrics used in shoemaking, for tops and for linings, must be sorted and inspected according to the weave, strength, and grades for particular uses. The lining sorter, who does this work, has usually had training in a textile school. He rarely learns the work in a shoe factory.

Opportunities for the Handicapped in the Sorting Room. There would be little opportunity for a handicapped person in the sorting room, unless he had had previous experience there. He could not do sorting or inspecting unless he had been a cutter, and he would need at least one good hand and should be able to move about freely. He might, however, test the feel of leather with his thumb and first or second finger if he had lost the other fingers of his right hand. He might sit at a table if some one else could keep him supplied with work, but that is not customary in the factory. Each operator must be able to do all that pertains to his task, that there may be a minimum number of workers employed. Defective sight would be a serious drawback in the sorting room; defective hearing, of slight consequence, as each man has only to follow the cutting room tag.

Weighing and handling lots of leather require considerable moving about, but the work in most cases could be done by a person having one artificial hand and freedom from serious bodily handicap. None of the work of the sorting room calls for great strength, and well-controlled hernia would not incapacitate a man for it. The handicapped person might learn to sort linings by attending a textile school.

The earnings of workers in the sorting room run about as follows:

Worker	Beginning or Minimum Pay	Maximum Pay
1. Inspector	$20.00	$40.00
2. Head Sorter	20.00	35.00
3. Sorters	15.00	30.00
4. Weighers	12.00	20.00
5. Men Helpers	12.00	18.00
6. Girls	10.00	15.00

There is little opportunity for promotion in the sorting room below the work of the sorter, who may become a head sorter or an inspector.

The sorting room of a modern shoe factory is usually clean, light, well ventilated, and quite free from dust. The work is agreeable and interesting in the great variety of materials handled.

Lining and Cloth Cutting Department. Shoe trimmings may be included with tops and linings. Trimmings are the stays, facings, and other small parts of the upper. The cutting of cloth tops and linings was formerly done by hand. The usual lining parts are, quarter lining, top band, inside stay, fly lining, back stay, and tip. The hand cutter places a pattern upon the cloth and draws a knife quickly around the edge of the pattern. He may thus cut either single thicknesses or layers up to eight thicknesses. Such hand cutting is not accurate and is not rapid enough for present demands. Cutting cloth parts by metal dies is coming increasingly into use. The die is made in the shape of the usual pattern. It is accurate, and many thicknesses of fabric can be cut at one time.

Hand dieing is done by placing the die upon a cloth with the left hand and striking upon it with a heavy hammer or mallet with the right hand. This method, while more rapid than that of hand cutting, is being used less and less. Dinking is the term used for machine dieing. By this method the die is placed upon many thicknesses of fabric on the table of the machine, and pressure by the foot upon a lever brings the heavy top of the machine down upon the die, thus cutting all the thicknesses of the cloth. Machine dieing is used increasingly and solves the difficulty of securing accuracy and speed in cutting cloth tops and linings.

The positions connected with the cutting of cloth tops, linings, and trimmings are usually as follows:

1. Foreman
2. Instructor
3. Hand Cutter
4. Hand Dinker
5. Machine Dinker
6. Pattern Boy
7. Cloth and Lining Folder
8. Piece Sorter
9. Inspector
10. Cripple Cutter
11. Stock Man

The chief work of the department is that of cutting, already described. The pattern boy secures and cares for the patterns; folding and sorting may be done by girls and women. The inspector examines the fabrics used and the work done upon them. The cripple cutter cuts duplicate pieces to take the place of defective parts that may be found in the regularly cut lots. The stock man has charge of all materials in the room. He must know the nature and uses of each and have it ready for cutting at any time. In large factories an instructor is employed to aid the foreman in teaching new employees.

Opportunities for the Handicapped in the Lining and Cloth Cutting Department. In general, the work of cutting in this department requires two good hands and general health and strength and ability to move about freely. One might, however, do hand cutting and hand dieing if he had an artificial appliance in place of his left hand, or arm and hand, by which he could manipulate the pattern or the die. He would need an uninjured right hand for cutting, or at least a very perfect artificial appliance for wielding the mallet. All methods of cutting could be performed by a person sitting, provided he could reach his materials easily. A person having two hand appliances might do machine dieing, since it consists merely in placing the die in one position after another and working the lever of the machine with the foot, which also might be artificial. The various other duties of this department might be performed by men with various handicaps, but they are mainly the work of girls and women. The inspector or stock man might be a handicapped person, but would need to have had long experience in the work of the department. Inexperienced persons are taken in and trained for most of the work of this department by the foreman or special instructor.

Pay in this section ranges about as follows:

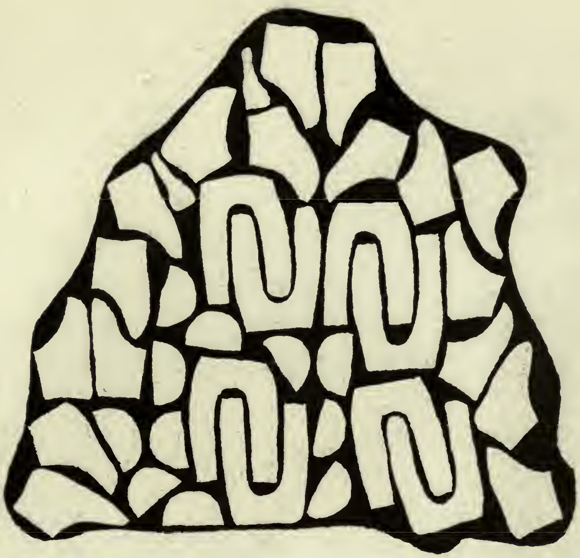
Worker	Beginning or Minimum Pay	Maximum Pay
1. Foreman	$20.00	$35.00
2. Hand Cutter	15.00	28.00
3. Hand Dinker	15.00	25.00
4. Machine Dinker	18.00	30.00
5. Folder	10.00	15.00
6. Sorter	10.00	18.00
7. Inspector	15.00	30.00
8. Cripple Cutter	15.00	25.00
9. Stock Man	15.00	25.00
10. Pattern Boy	8.00	12.00
11. Instructor	15.00	30.00

Promotion in this room runs in the usual lines. The hand cutter may become a machine dinker, and both positions may lead to the foremanship. Regularly, however, the fabric cutters may pass on to upper leather cutting after one year or more of service. The fabric sorter may become fabric inspector. The cripple cutter and stock man usually remain permanently in their positions.

Working conditions here are healthful in a modern factory. In old factories there is often considerable dust from worn wooden floors and from the accumulations of fabric fragments.

The Cutting Room. The most important section of the large upper leather department is the cutting room, in which the leather for the upper parts of the shoe is cut by hand or with a die.

The Hand Cutter. Throughout the long period covering the introduction of machinery into the shoe factory, cutting the upper parts of the shoe by hand has remained in practice. It is still in general use in the smaller and older factories and in factories that handle small skins. It is an expert operation and demands years of practice for the finest work. It is so satisfactory that it gives way but slightly to machine cutting even in the most modern factories. Hand cutting results in the most economical use of leather, as the hand worker is more likely to place his pattern so that the skin may be cut according to the qualities needed for the different parts of the shoe. Hand cutting is done on blocks of wood made especially for the purpose or thick cutting boards arranged at a convenient height for one standing at work. The cutter uses a short-bladed, keen-edged knife. He must know how to keep his block or board smooth and oiled and his knife sharp. He is sometimes called 'outside cutter', to distinguish him from the cutter of linings and trimmings.



A skin showing how patterns are placed in cutting

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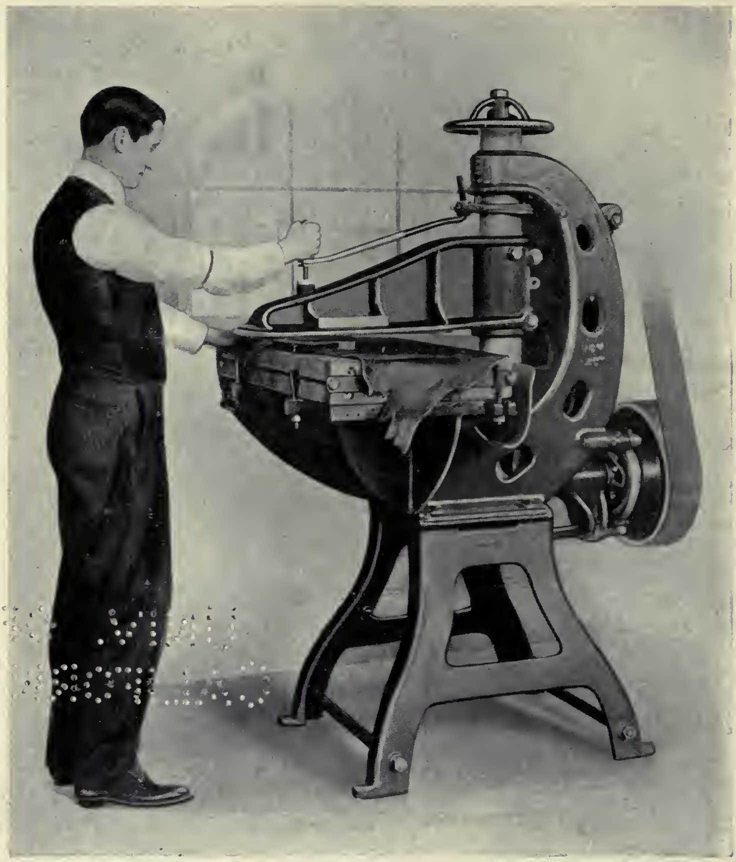


Operating the Clicking Machine

The cutter is given a roll of leather with its tag from the sorting room and the necessary patterns from the pattern room. He first lays out his patterns conveniently at his left hand in the order of their size, and then unfolds one skin at a time upon the block. He places a particular pattern upon it so that the part selected is best suited to the corresponding part of the completed shoe, and draws his knife point skilfully around the metal edge of the pattern from left to right. This, of course, involves numerous motions and directions of cutting. The patterns are laid alternately and with such variations of size as to make the most economical use of the entire skin. The cutter places all his cut parts in piles and marks the upper piece in each case by pattern, size, width, and style. He ties up these lots with the tag showing and sends them to the assembly room where are sent also the corresponding lining parts. The larger waste parts of cutting are used for trimmings; the smaller are usually sold for use in leather substitutes, or for the oil that may be extracted from them. An exact efficiency record is kept for each cutter, and totals of the work done in the room are placed upon the day sheet.

The Clicking Machine. In the large shoe factories machines for cutting upper leather are coming gradually into use, and hand cutting and machine cutting are found side by side. Late methods of tanning make skins more uniform in quality and the demand for speed is becoming more and more urgent. The machine now in use is called the clicking machine. It has a cutting board or block like that used by the hand worker and has a strong arm or beam that swings from side to side over the block. The operator stands and places a skin upon the block just as the hand worker would do and places a die, instead of pattern, upon the same selected portion of the skin. With his right hand he swings the beam of the machine over the die, pressing it through the leather by the automatic action of the machine.

Cutting is done upon one thickness of leather only. One movement of the arm of the machine guided by the operator accomplishes in a few seconds what it would take the hand cutter considerable time to do in passing his knife entirely around the edge of the pattern. Machine cutting produces exact sizes, while hand cutting necessarily results in some variations of size. Women are now being employed as hand cutters and produce very satisfactory results. Their quickness of perception and deftness of hand enable them to greatly excel the male cutter. They are not likely to be replaced by men after the war is over.

Opportunities for the Handicapped in the Cutting Room. A person should have two good hands for hand cutting. The loss of the left hand would make it difficult to place the patterns economically and rapidly. One might use the knife efficiently if he had lost the two smaller fingers of his right hand, but not with greater injury than that. A person having lost one or both legs might cut by sitting at a table, but could not do the work fast enough to earn satisfactory wages, as a definite standard is set in cutting and the operator must be able to work very rapidly. Serious trunk wounds might interfere with a person's speed in cutting and his eyesight must be good. Deafness would not be a handicap. Machine cutting, however, is possible for a person who would be obliged to work sitting, and even to move the dies about on the clicking machine with an appliance for the left hand. The question in this case would be the speed possible for the operator to maintain as he would have to meet the standard of production.

The hand cutter learns the process by working for one year or more in cutting fabrics in the lining and cloth cutting department or by working upon leather in the cutting room of a small factory. The clicking machine operator is usually a hand cutter transferred to the machine.

The earnings of the hand cutter and of the machine cutter are now $25 to $40 a week, while before the war the pay of the cutter varied from $17 to $28 or $30 a week.

There is no promotion in the cutting room or from it to any other room. It is one of the most skilled and desirable operations in the shoe factory. An efficient hand cutter usually remains a hand cutter throughout the years of his employment in the shoe factory.

The cutting room is generally clean and free from dust. It must always be well lighted, and for this reason it is situated on the top floor of the factory with windows in the roof opening to the north to secure an unchanging light throughout the day. The work is agreeable in the handling of leathers of fine qualities and various colors.

The rest of the work of the upper leather department consists of counting, marking, skiving, and assembling. In a large factory they constitute separate rooms. All these duties are performed regularly by girls and women. While they might be done by men with various handicaps, the pay would be small and shoe manufacturers would not change from their present custom of female employment. Here again the quickness and adaptability of the woman outweigh all other considerations.

Skiving is the most important operation after cutting. The edges of the upper leather which are to show in the finished shoe are beveled, or 'skived', so that they may be folded in to give a more finished appearance to the completed shoe. This work is done by girls upon skiving machines. The beveled edges are covered with a coating of leather cement, and placed in a machine which folds and presses them at the same time. Sometimes edges which will show in the finished shoe are scalloped, and curved edges have little notches cut in them upon the nicking machine. The skiving department includes counting and marking. The usual workers are: Forewoman; floor girls, who give out lots of work to be done, gather them up, and check them off; counters and markers; skivers, nickers, and scallopers; edge stainers, and machinist.

In the assembling room shoe uppers, linings, trimmings, and tips are brought together. These are placed in boxes according to tags, so that each box contains all the parts necessary for a definite lot of complete uppers. Then these assembled parts are divided and sent to the various sections of the stitching room.

CHART of the UPPER LEATHER DEPARTMENT

Upper Leather Department
Sorting Department
Trimming Cutting and Dinking Department
Lining and Cloth Cutting Department
Upper Cutting Department
Counting Marking and Skiving Department
Assembling Department

VII. The Stitching Department

In the stitching department the outer parts of the upper, the linings, and the trimmings are sewed together upon machines, ready for lasting and bottoming. It is sometimes called the 'fitting room'. It is the largest department of the factory, employing over one-fourth of all factory workers. In a factory of 5000 employees about 1400 are in the stitching room.

In earlier times stitching was done chiefly by girls and women. In late years men have taken up the more difficult kinds of machine sewing, such as top stitching and vamping, in which considerable strength is required. At present, about one-third of the operatives of the stitching room are men.

The work of this room deserves special attention on account of its magnitude and many highly skilled processes. The machines used here are similar to the ordinary sewing machine. Because of the many parts entering into the shoe upper, and because of the many styles and kinds of men's, women's, and children's foot-wear, a great number and variety of processes are found in the stitching room. For example, there are forty or more different pieces of material entering into the uppers of an ordinary pair of shoes. All these parts require sewing. The linings and trimmings are given to one division of operators, the outsides to another, and the vamps and tips to another. These parts are all brought together after sewing, inspected, and sent to the lasting room.

The Divisions of the Stitching Department. The divisions determined by the various upper parts to be sewed are as follows:

1. Lining Department.
2. Tip Department.
3. Closing and Staying Department.
4. Foxing Department.
5. Top Stitching Department.
6. Button Hole Department.
7. Vamping Department.
8. Toe Closing Department.

In a factory of considerable size one man acts as a superintendent of this great department, while its eight subdivisions are in charge of forewomen under him. Forewomen are now very generally in charge of rooms in which most of the operatives are girls or women. Sometimes there is a foreman, with an assistant forewoman.

The Lining Department. In this section the various parts of the linings are pasted and sewed together in preparation for sewing to the leather upper in the top stitching department. Each step named constitutes a separate process.

First, the two pieces of lining for each shoe are 'closed', or sewed in a seam, and taped, or stayed, up and down the heel. The top band is then sewed on, the button fly is stitched in, and a lining is stitched upon the tongue for some shoes. Finally, the vamp lining is cemented in place for later sewing.

Aside from the several minor duties, regularly performed by girls, the more important positions in lining stitching are:

1. Superintendent
2. Forewoman
3. Inspector
4. Lining Closer
5. Lining Stayer
6. Top Band Sewer

The Tip Department. Tips come from the cutting room tied in bunches separate from the rest of the shoe. In the tip department they are skived, perforated for adornment, and fitted with linings. A toe box which gives reinforcement and shape is inserted and cemented. The tip may be skived and folded in, perforated, nicked, scalloped, or plain. The lining is cemented in, taped over seams, and pressed firmly in place upon a machine. The whole is top-stitched on a machine, through leather and lining, just below the line of perforation. Then the tip is stitched above the perforation to the vamp of the upper, ready to go to the vamping department.

The positions in the tip department include the operations enumerated in the preceding paragraph and some small related processes.

The Closing and Staying Department. This department cements, sews, and secures the seams of the top part of the shoe upper, following the work done in the lining room and tip room. The button fly is pressed, closed, or sewed, upon one quarter, and the two quarters of the top are sewed together. There are numerous operations, of the same general nature, in this room of a shoe factory, which depend upon the kind or style of shoe being made. Special machines are in use for special kinds of shoes. The Oxford shoe and the Polish shoe, for instance, call for different sets of operations.

The usual positions in closing and staying are as follows:

1. Forewoman, or assistant to foreman
2. Inspector
3. Instructor
4. Closer
5. Label Girl and Cementer
6. Button Fly Presser
7. Button Fly Reinforcer
8. Stayer
9. Toe Piece Reinforcer
10. Cementer and Presser

The Foxing Department. This is one of the smallest divisions of the stitching room. The 'foxing' is a little piece of plain or ornamental upper leather sewed below the quarters, or main parts of the tops above the vamp.

The Polish shoe and the Oxford, however, have a long vamp and no foxing. Back straps and fly stays are stitched upon the quarters to which the foxing is to be attached, and then this is sewed on with one or two rows of stitching.

The chief positions in the foxing room include the forewoman, instructor, inspector and stitchers.

The Top Stitching Department. This is the division of the stitching room in which the tops of the leather uppers bearing the foxing, when that is attached, and the linings, coming from the lining department, are sewed together. First, the quarters and linings are matched upon tables and tied together in bundles, according to tag numbers, by floor girls, who take the bundles to the machine operators. Processes vary according to kinds and styles of shoes. The four leading processes in this division are among the most important in shoe manufacture. While once they were performed by women, men are now found in them in increasing numbers. These processes demand judgment, carefulness, and considerable strength as well as quickness. The four processes are as follows:

1. Top Closing, in which the quarters and lining are put back to back, wrong side out, and sewed along the edge of the top.

2. Pounding out Seam, in which the closed top and lining are turned right side out by hand and pounded flat and true on the outside.

3. Top Stitching, in which the turned top and lining are stitched all around except at the bottom where the vamp is to be attached.

4. Vamping, sewing the vamp to the closed, smoothed, and stitched upper. Vamping is usually done in the vamping room; it may, however, be done in the top stitching room. This is usually the case in making canvas shoes.

The leading positions in the department are as follows:

1. Forewoman
2. Instructor
3. Inspector
4. Operator of closing-on machine
5. Operator for turning and pounding top
6. Top Stitcher
7. Vamper

The Button Hole Department. The making of button holes on button shoes and the inserting of eyelets in lace shoes, small as these processes may appear in shoemaking, constitute a separate department. The button hole is inserted on a power machine, which cuts the hole and works it around at the same time. In eyeleting, the upper is first marked by hand, and then the eyelet is inserted on a machine. On men's high lace shoes hooks are inserted above the eyelets, by a similar machine. The department has a forewoman, instructor, inspector, operators for the button-hole machine and eyeleting machine, and for other small related processes. It is essentially a woman's section in the factory.

The Vamping Department. The vamp is the lower, front part of the shoe. A whole vamp extends from toe to heel, with a seam at the heel only. The more common is the 'cut off vamp', which extends forward only to the tip. The vamp is the part of the upper on which the greatest strain and wear come, and is regularly cut from the best leather. Canvas shoes are usually vamped in the top stitching room. This work on leather shoes requires a separate section. Vamping consists in sewing the vamp to the quarters of the top, each style of shoe calling for a particular process.

Vamping is the most painstaking work of the stitching room. Even now, three-fourths of the operators on this process are men.

The few positions in this work are: Foreman, instructor, inspector, and vamper.

The Toe Closing Department. This is the final division of the work in the stitching room. Tops and linings have been sewed together, and vamps have been sewed to the tops, when a job of work reaches this room. Here the toe lining is smoothed out and double-stitched. The process is called closing.

Machine operators in the stitching room generally learn by working upon linings, on cheaper leather parts, or on low-grade work in any factory. In all divisions the forewoman and her instructor teach new operators by giving individual attention. So important is it to have competent workers in the department that new girls, women, or men are constantly sought and given training on special operations. Many workers are trained in several kinds of stitching, so that a scarcity of operators at any time on any set of machines may be met by transferring operators from other machines.

The running of a power sewing machine calls for considerable training and skill, and for at least fair health and strength. On all machines the start is made by pressing the toe on the treadle, and the stop by pressing with the heel.

Some automatic machines produce in operators a nervous, spasmodic action. This is especially noticeable in running the barring machine and other machines having an eccentric movement. In such cases, operators are usually transferred in time to different or less injurious machines or processes.

Opportunities for the Handicapped in the Stitching Department. This is the division of the shoe factory in which there seems to be the largest number of opportunities for handicapped persons to work. All machine operations are performed sitting. But in general one must have good eyesight, two good hands to direct work in the machine, and one good leg to start and stop the machine. Yet a person with one natural hand, and an appliance for the other, might do sewing on some of the minor processes, in which the part could be guided mainly by one hand. A person having only the thumb and first or second finger of either hand might perform some of the processes of stitching, if he could handle and guide materials accurately in the machine. And if a man had lost both legs a mechanical appliance for the leg or foot might be so perfect and sensitive to position and motion as to enable an operator to start and stop a sewing machine at will. Head, neck, or trunk injuries which did not prevent a free movement of the arms and shoulders when seated at the machine would not seriously incapacitate a worker. Serious hernia or bodily injuries would incapacitate one. A person suffering seriously from nervous shock could not work at a power sewing machine.

The following division indicates the more difficult and less difficult processes of the stitching room from the standpoint of work with the hands. Most of the minor operations, regularly performed by girls, are omitted.

A. Processes demanding a worker with two good hands:

1. Lining Closing and Staying
2. Tip Skiving and Lining
3. Cementing Tip Lining
4. Inserting Toe Box
5. Tip Stitching
6. Top Closing and Staying
7. Pounding the Seam in Top Closing
8. Top Stitching
9. Button Hole Making
10. Vamping

B. Processes which might be performed with one good hand and a mechanical appliance for the other:

1. Cementing vamp lining
2. Tip Perforating or Nicking
3. Button Fly, Pressing, Closing, and Staying
4. Stitching Back Straps, Loops, and Buckle Straps
5. Foxing Stitching
6. Inserting Eyelets and Lace Hooks
7. Toe Closing

The so-called 'table work' of the stitching room, such as counting and matching leather and lining parts of uppers, could be done by handicapped persons, but would pay low wages; from $10 to $15 a week.

Pay in the stitching room runs about as follows:

Operation	Beginning or Minimum Pay	Maximum Pay
Table Work	$10.00	$15.00
Minor Operations	12.00	18.00
Backstay Stitching	16.00	20.00
Buttonhole Making	16.00	20.00
Closing-on	25.00	30.00
Foxing	16.00	20.00
Tip Stitching	18.00	25.00
Top Stitching	20.00	30.00
Vamping	25.00	45.00

Promotion is common in the stitching department of a shoe factory, from table work to minor machine processes, and from minor to major machine processes. The one or several chief operations in each room of the department are the most desirable and best paying, while closing-on, top stitching, and vamping stand out as the best of all work in the department.

In old factory buildings, in the older shoe manufacturing centers, the stitching room is often poorly lighted and dusty. The newer factories have larger window spaces, so that even the middle portions of the room are light and cause no eye strain. They have better floors, also, and have them swept up twice a day, during the lunch hour and at night. There is a great deal of noise from the constant running of the many power machines of the average factory, and the close attention necessary for accurate and rapid work is wearing upon the operator. Sitting at the machine and the constant bending of the head and shoulders over one's work are, of course, injurious if kept up for years.

CHART of the STITCHING DEPARTMENT

Stitching Department
Lining Department
Tip Department
Closing and Staying Department
Foxing Department
Top Stitching Department
Button Hole Department
Vamping Department
Toe Closing Department

VIII. The Sole Leather Department

The sole leather division of the shoe factory deals with the preparation of the bottom parts of the shoe. It is often called the bottom stock fitting department. Its subdivisions prepare the following parts:

1. Inner Soles
2. Outer Soles
3. Counters
4. Toe Boxes
5. Heels

These sole leather parts may all be prepared, in the rough, in special factories, and sold to the ordinary shoe factory in quantity, or the large shoe factory may itself make them all. In either case the work done upon the parts is the same. McKay shoes and Goodyear welt each call for some special processes, and the increasing use of leather substitutes for insoles modifies the work done.

The Inner Sole Department. The use of poorer parts of the hide, or substitutes, for the inner sole, the use of canvas in reinforcement, and the necessity of preparing this sole for the attachment of both top and outer sole, make the inner sole department the most important in bottom stock fitting.

Light sole leather is generally used for the McKay inner sole. It is dipped in a solution of glue to stiffen it, dried, and cut out by a die upon a machine. The chief process here is that upon the dinking machine.

Welt inner soles are made of leather of good quality or are reinforced by canvas cemented upon it. The soles are dinked out and sometimes passed through a heavy rolling machine to wet and press the fibers of the leather closely together, to increase its strength for holding stitches. A channel is cut around the sole on its under side and the welt is sewed to this. The canvas reinforced insole is treated in much the same way as the other, except that it is not rolled. It is characterized by lightness and strength.

The most important workers in this division are:

1. Foreman
2. Assistant Foreman
3. Inspector
4. Dinker and Stamper
5. Heel Marker and Cutter
6. Channeler
7. Wetter and Cementer
8. Rander
9. Canvas Cutter
10. Canvas Attacher

There are several related processes, done usually by girls.

The main processes in the treatment of outer soles are similar to those given inner soles. The outer sole is first blocked or dinked out in the rough, and then 'rounded' into approximate shape for attaching to the shoe top and inner sole.

The Counter Department. The counter is a stiffening material in the back of the shoe between the leather and the lining, around the heel of the foot. Its purpose is to keep the heel from 'running over' at the side. It is made of sole leather or of numerous substitutes. It is cut out with a die, its upper edge skived thin, and then it is wet and molded into shape. Each of these processes is short and simple. A considerable number of boys and girls is usually employed in this department.

The toe box is a reinforcement placed in the toe of a shoe, similar to the counter at the heel but meant to give distinctive style to a shoe. The processes in making toe boxes are the same as in counter making.

The Heel Department. Heels are usually made of the poorer parts of sole leather, including the remnants from soles, counters, and toe boxes, leather board, other substitutes, and wood. The small pieces used for the heel are usually skived to even thickness and rolled to make them hard and firm. Then they are cut into various heel lift sizes upon the dinking machine, with due care in getting the most out of each piece. In 'heel building' the worker places one lift upon another, by graded sizes, up to the desired height. This pile is pasted or glued and a nail is driven through it by a machine to hold it firmly together until it is attached to the shoe in the bottoming room. The heel is then compressed in a machine, and its front or breast is later cut off smoothly before attaching. A top lift of superior leather is added in the bottoming room.

The processes of heel making are simple and easy, and mostly performed by boys, girls, or women. Heel building is somewhat more difficult. It calls for judgment, speed, and some strength.

The heavier process in the sole leather department and the larger machines require men as operators, but the many lighter processes and the handling of small parts make possible the employment of large numbers of boys and girls and women. In the average factory this department usually has about an even division of male and female employees, standing next to the stitching room in its proportion of the latter.

Opportunities for the Handicapped in the Sole Leather Department. Men who would be obliged to sit at their work through loss of one or both legs could do table work and bench processes in the sole leather room. They could operate the dinking and rolling machines, by sitting and being able to work the levers. Injuries to head or trunk, including controlled hernia, would not incapacitate a worker in this room, if he could keep up to speed. Channeling and heel building would require two good hands and ability to move about freely. The operations on the counter and toe box could be performed by a person who had lost several fingers of either hand or had a mechanical appliance for his left hand.

The machine processes in the sole leather room are taught to beginners by the foreman or his assistant. Most of these processes are simple and easily learned in a few days or a few weeks. Any worker may be taught several processes.

Pay for the minor operations of the department ranges from $10 to $15 a week; for the work of ordinary difficulty, from $12 to $20; and channelers, machine dinkers, and heel builders earn from $18 to $30.

A person may be promoted from bench work to a minor process, and from a minor to a major process.

Work conditions in this department are less favorable than in the upper leather department or stitching room. The use of large quantities of gum, glue, and water in the treatment of sole leather produces considerable dampness, and the extensive use of leather fragments and cheap substitutes causes accumulations of dust. The modern factory minimizes these dangers by constant cleaning of floors, tables, and machinery. There is no especial danger from machinery in the room.

IX. The Making Department

This department embraces the heaviest and most exacting work of shoe manufacture. The major operations are regularly performed by men, who must be strong and active. Boys, girls, and women, usually about one-fourth of the operatives of the room, assist by doing the lesser processes and by handling materials. The machines used are always placed along the sides of the room, next to the windows, to secure good light for the many intricate operations necessary.

The department is called also the bottoming department and the 'gang' room. In the earlier factories the work of the room was done mainly by gangs of men, and these are still found in some factories.

In the making department the uppers of shoes, prepared in the upper leather room and stitching room, and the soles, prepared in the sole leather room, are brought together, lasted, and made into shoes ready for finishing.

The department has the following divisions:

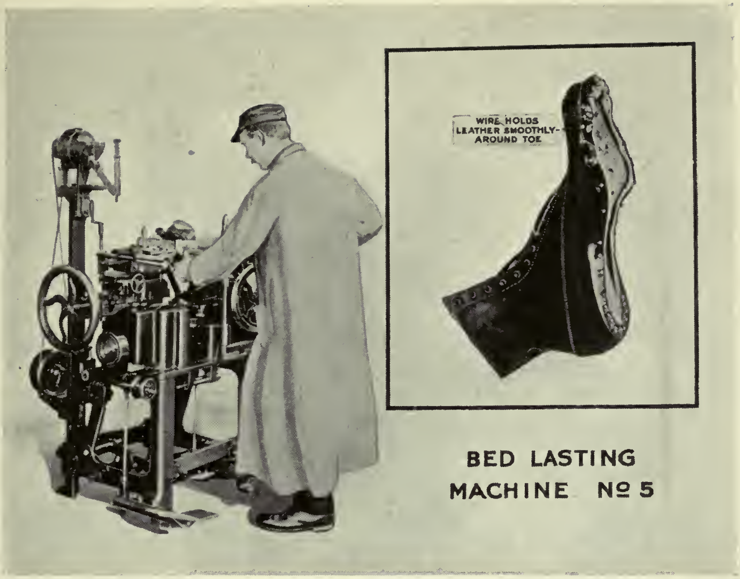
1. The Lasting Department
2. The Welt Bottoming Department
3. The McKay Bottoming Department
4. The Heeling Department
5. The Turned Shoe Department
6. The Standard Screw, Nailed, or Pegged Department

These divisions are not clearly drawn, and through them all runs one general method of bottoming which is modified only by the kinds and styles of shoes manufactured.

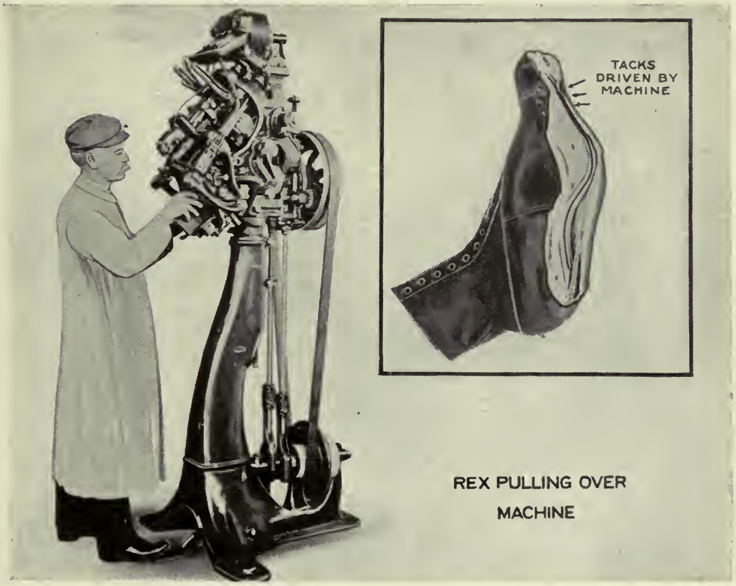
The Lasting Department. Here begins the work of bottoming the shoe. Lasting consists in drawing the shoe upper, both leather and lining parts, over the top of the last and inner sole, so that the outer sole may then be attached. Shoes are lasted both by hand and by machinery. The processes involved demand carefulness and strength. The box toe is put in its proper place between upper and lining, and the counter in its place at the heel. The inner sole is tacked upon the bottom of the last. Then, by hand or on the lasting machine, the full upper is drawn over the last and inner sole and tacked in place temporarily. Then the shoe is placed upon the pulling-over machine, which has pincers that act like the fingers of the hand, grasping the leather and drawing it in and over evenly around the last. By an adjustment of levers, drawing in and tacking the parts down are done automatically. The surplus leather pulled over the bottom at the toe and heel is removed upon the upper trimming machine in which a knife cuts the extra parts evenly away. Upon another machine the leather and counter around the heel are beaten or pounded down to the shape of the last. Then the shoe is ready for the outer sole.

The four important processes in lasting are operating the lasting machine, the pulling-over machine, the trimming machine, and the pounding machine.

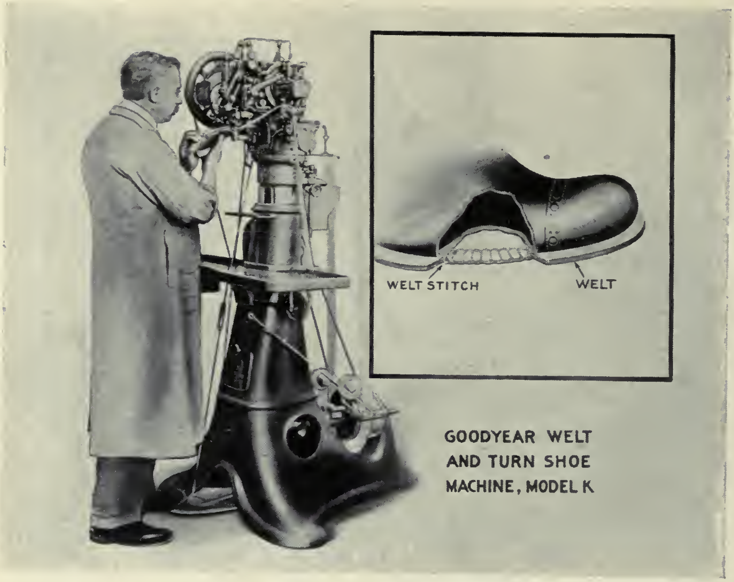
The Welt Bottoming Department. The welt method of attaching the outer sole is coming increasingly into use, since it produces a smooth bottom inside the shoe, and greater flexibility and ease in repairing. The welt is a narrow strip of leather so prepared that it may be sewed first to the lip of the inner sole and to the upper leather, and then to the outer sole. Thus these three parts are joined firmly together, with no stitching passing entirely through the bottom of the shoe as in the McKay method. It is claimed that this particular improvement has been the leading factor in the great development of shoemaking in recent years.



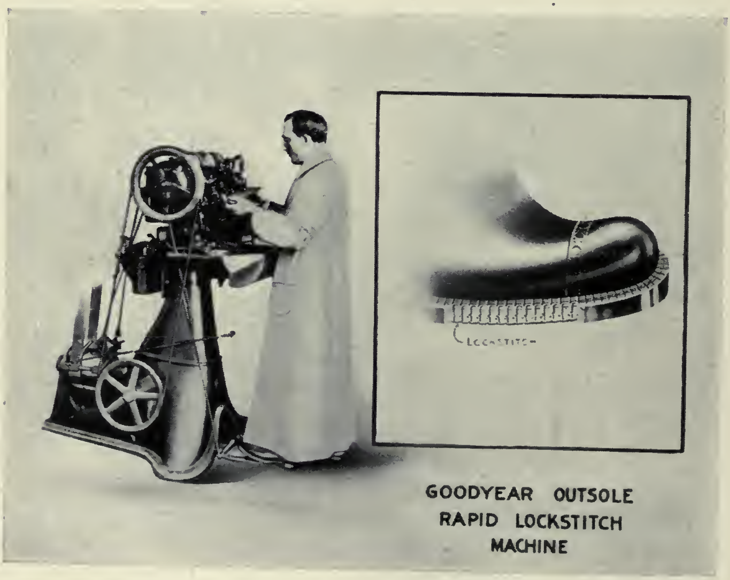
BED LASTING MACHINE Nº 5



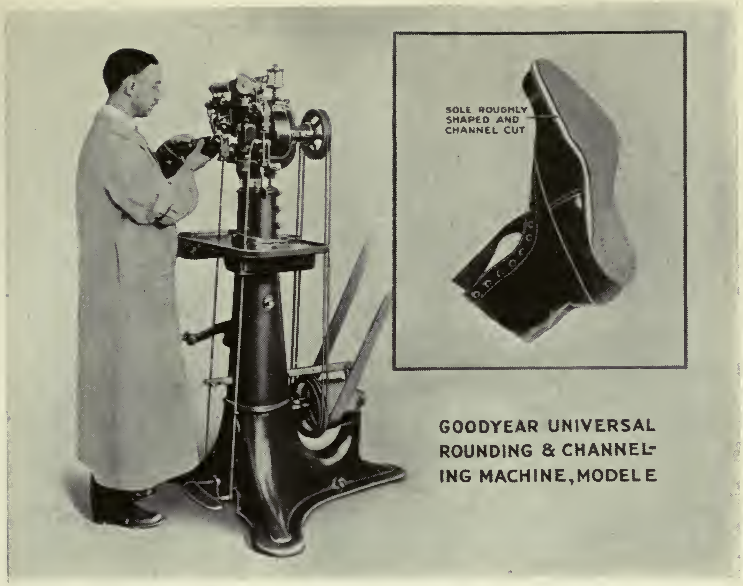
REX PULLING OVER MACHINE



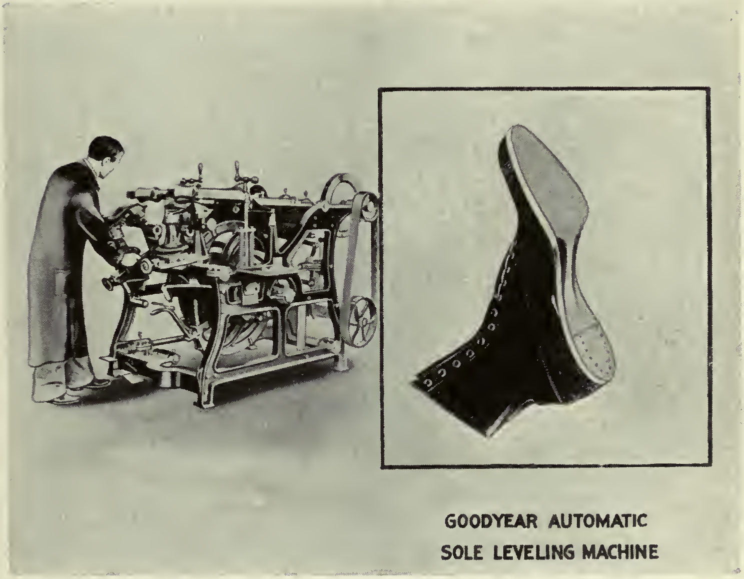
GOODYEAR WELT AND TURN SHOE MACHINE, MODEL K



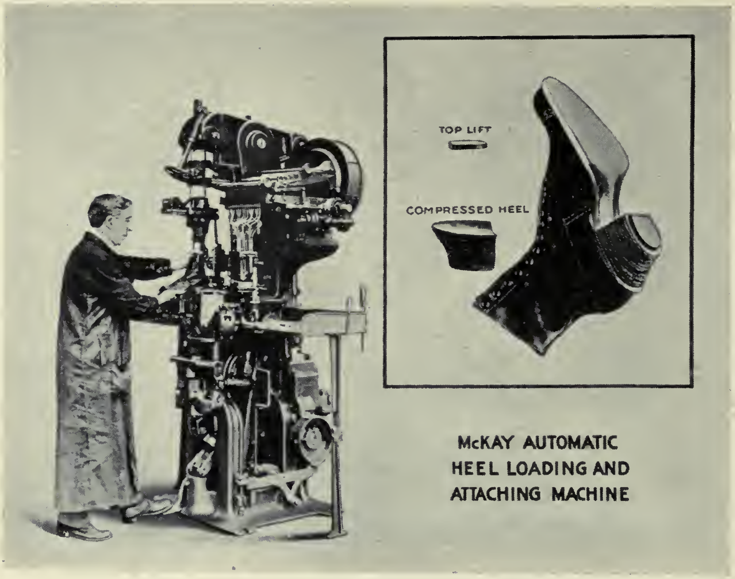
GOODYEAR OUTSOLE RAPID LOCKSTITCH MACHINE



GOODYEAR UNIVERSAL ROUNDING & CHANNELING MACHINE, MODEL E



GOODYEAR AUTOMATIC SOLE LEVELING MACHINE



McKAY AUTOMATIC HEEL LOADING AND ATTACHING MACHINE

The welt is beaten down smoothly, and the bottom of the insole and welt is covered with a coating of cement. At the same time the outsole which is to be attached is coated with cement. Within a few minutes, when the cement has partially dried, the outsole is put in place and pressed firmly in the sole laying machine, remaining long enough for the cement to hold firmly. Then follows one of the most arduous processes of the factory, 'rough rounding'. This consists in trimming the sole and welt, now cemented together, so that they will extend a uniform distance out from the upper leather. The operator holds the shoe up firmly against the cutter of the rough rounding machine, turning the shoe a nearly complete revolution, and trimming it entirely around in front of the heel seat. The machine gauges the distance of cutting from the last, and cuts a little channel in the bottom for concealing the stitching which is yet to be done. The sole is trimmed at the heel on the heel seat rounding machine, and nailed to the inner sole.

The outsole is now stitched to the welt entirely around the shoe upon the lockstitch machine. The lip of the channel is cemented and pressed down smoothly over this stitching in the channel laying machine. Then the shoe is put beneath the roller of the automatic sole leveling machine, which removes every unevenness.

From this point on the blacking, burnishing, and finishing processes take place. The edge of the shoe is burnished on the edge setting machine, being held against two rapidly vibrating hot irons. The other processes may be done in the bottoming department or in a separate finishing department. The bottom of the shoe is buffed upon revolving rollers covered with sand paper, to remove the marks of handling in various operations, and to a finer degree in several processes to give polish. The treatment of other finishing processes is given in a later section of this Bulletin.

The list of workers in the welt bottoming department is a long one. It is usually about as follows:

1. The Superintendent
2. Foreman
3. Assistant Foreman
4. Tack Puller
5. Welter
6. Inseam Trimmer
7. Welt Scarfer
8. Welt Beater
9. Shank Nailer
10. Bottom Filler
11. Welt Cementer
12. Sole Cementer
13. Sole Layer
14. Heel Seat Nailer
15. Rough Rounder
16. Channel Opener
17. Goodyear Stitcher
18. Channel Cementer
19. Channel Laver
20. Wheeler
21. Rander
22. Leveler
23. Heeler
24. Slugger
25. Heel Shaver
26. Heel Breaster
27. Edge Trimmer
28. Heel Scourer
29. Heel Jointer
30. Edge Setter
31. Burnisher
32. Blacker
33. Buffer
34. Hard Finisher
35. Polisher

The McKay Bottoming Department. In McKay bottoming the upper is attached to the sole by a machine which sews directly through the outsole, upper leather and lining, and insole. The work is done in a separate room where the lasted upper comes from the lasting room. The outsole comes from the sole leather department, where it has been kept moist for use. First, the surplus leather and nails of the upper on the last are ground off on an abrasive wheel, so that the outsole will lie flat when put on. This sole is put in place and tacked upon another machine. The last is then withdrawn by hand, and stitching is performed upon the McKay stitching machine. The process is a heavy, exacting one, and is still used very widely, in spite of the superiority of the welt method. Other work on the

McKay shoe is so nearly similar to that on the welt shoe that it need not be detailed here. Before relasting McKays a bottom lining, or second thin inner sole, is inserted.

The Heeling Department. The heel is attached upon the heeling machine. The shoe is placed upside down on a jack in the machine, the heel, already built up, is set in place, and an arm bearing the nails is swung automatically over the heel, driving the nails through heel, outsole, upper leather, and insole, where they are clinched on the inside. The action of this machine is like that of the clicking machine in the upper leather cutting room, though it is more powerful and heavier to run. A top lift is added to the heel, covering the nails inserted by the machine, and slugs are driven into it.

The heel is now trimmed on the heel trimmer, which by means of a rapidly revolving knife cuts away all the surplus leather on the outside. This process is a very exacting one, calling for strength and skill. Like the movement of rough rounding the sole, the heel must be turned in a circle from one corner to the other. It is more injurious to the wrist of the operator than is sole trimming, as greater pressure must be exerted to cut off the surplus leather of the thick heel, and the wrist is twisted as well as turned. It sometimes produces what is called 'broken wrist', or a weak wrist. In this case the operator is transferred to some other, lighter process.

The three processes in this room are nailing on heels, slugging, and trimming.

The Turned Shoe Department. Some light shoes and slippers have always been made wrong side out and then turned right side out. This is possible only when thin, flexible sole leather is used. This method produces footwear of indoor comfort rather than of wearing qualities.

The Standard Screw, Pegged, or Nailed Department. Various kinds of heavy working boots and shoes are manufactured by the methods used in these departments. In the case of the standard screw, a wire with screw thread upon it is driven through the bottom of the shoe and automatically cut off by the machine, piece after piece, rapidly around the bottom. In the pegged shoe a machine inserts wooden pegs instead of the sections of wire. The use of pegs is gradually passing out of shoemaking. By the third method nails take the place of wire and of peg, and are clinched on the inside. The accompanying processes are like those of the welt and McKay shoes, but finishing is not carried to the same degree of perfection. The three methods produce strong, but heavy and inflexible footwear.

Opportunities for the Handicapped in the Making Department. This is the department of the factory in which able-bodied workers are most necessary. The heaviest processes of shoemaking are connected with bottoming. Men who work upon the machines should not only be strong but active, able to move about to get materials to work upon and to step quickly, back and forth or around a machine while working at it. A worker could not sit and run the heavy machines used in this room. He needs to be on his feet and have leg strength to brace himself at his work, as, for instance, in rough rounding or heel trimming. But the lighter processes, such as tack pulling, shank nailing, bottom filling, welt and channel cementing, channel laying, heel seat nailing, wheeling, randing, leveling, scouring, burnishing, blacking, buffing, polishing, and most of the turned shoe work, could be performed sitting. These operations are now done in part by girls and women, and standing, but seats could easily be arranged at each machine so that a handicapped worker could operate it. Each of these operations could also be performed by a person having a good right hand, or thumb and first or second finger on the right hand, and a mechanical appliance for the left, provided he could keep up a fair degree of speed. The loss of one eye would not interfere with the work, and deafness would not incapacitate one. Head or bodily injuries that would interfere with free movement would be handicaps. A person suffering from shell shock would not be suited to work in the bottoming room.

The various processes of the making room are still learned by working at a machine or bench, with instruction from the foreman, his assistant, a special room instructor, or some expert workman. Those who wish to become operators are more often given a chance to learn in a small factory or in a less busy time in a large factory. A person with average intelligence and ability should become able to run any bottoming machine in three months. Not only must the hand and eye be trained, but a new set of muscles must be developed in action. Frequently, of course, a person learns to run more than one machine.

Pay on the leading operations in the making room of a large factory ranges about as follows:

Process	Beginning or Minimum Pay	Maximum Pay
Buffing	$15.00	$25.00
Edge Setting	20.00	35.00
Edge Trimming	20.00	35.00
Goodyear Stitching	20.00	40.00
Goodyear Welting	22.00	40.00
Heel Breasting	15.00	25.00
Heel Burnishing	15.00	25.00
Heeling	20.00	40.00
Heel Scouring	15.00	25.00
Heel Trimming	20.00	40.00
Lasting, Various Processes	15.00	35.00
McKay Sewing	18.00	35.00
Rough Rounding	20.00	40.00

The above represent no absolute minimum and maximum earnings in the industry. Factories of different size and in different localities pay varying wages. The first column of figures might be taken as the average rates in small country factories; and the second column, as the rates paid in large shoe centers. Operations not included in the list pay lower wages, or living wages for a man—from $10 to $18 or $20 a week.

There is no regular line of promotion in this department. The operators of the more important machines do the same work for years. A person doing a minor process may be allowed to learn a major one if he has the requisite strength and ability, as it is not always easy for the factories to secure capable operators for the more difficult machines.

The chief objection to working in the making room is the incessant noise of the large number of heavy, automatic power machines necessary in this room in any factory of size. Stitching on the various parts of the shoe bottom, always at a rapid speed, is taxing upon the eyes. And the glare of the burning jets of the edge setting machine, always near the eyes of the operator, is blinding. The effects of work on the sole and heel trimming machines have already been spoken of. There is danger of injury to the hands or fingers from the tacks used in lasting, from the wire and nails used in low grade shoes, and less frequently from the heavy needles used in the sole sewing machines. There is usually considerable dust in this room. The abrasive machines are, of course, covered with hoods which minimize this danger.

X. Finishing and Treeing

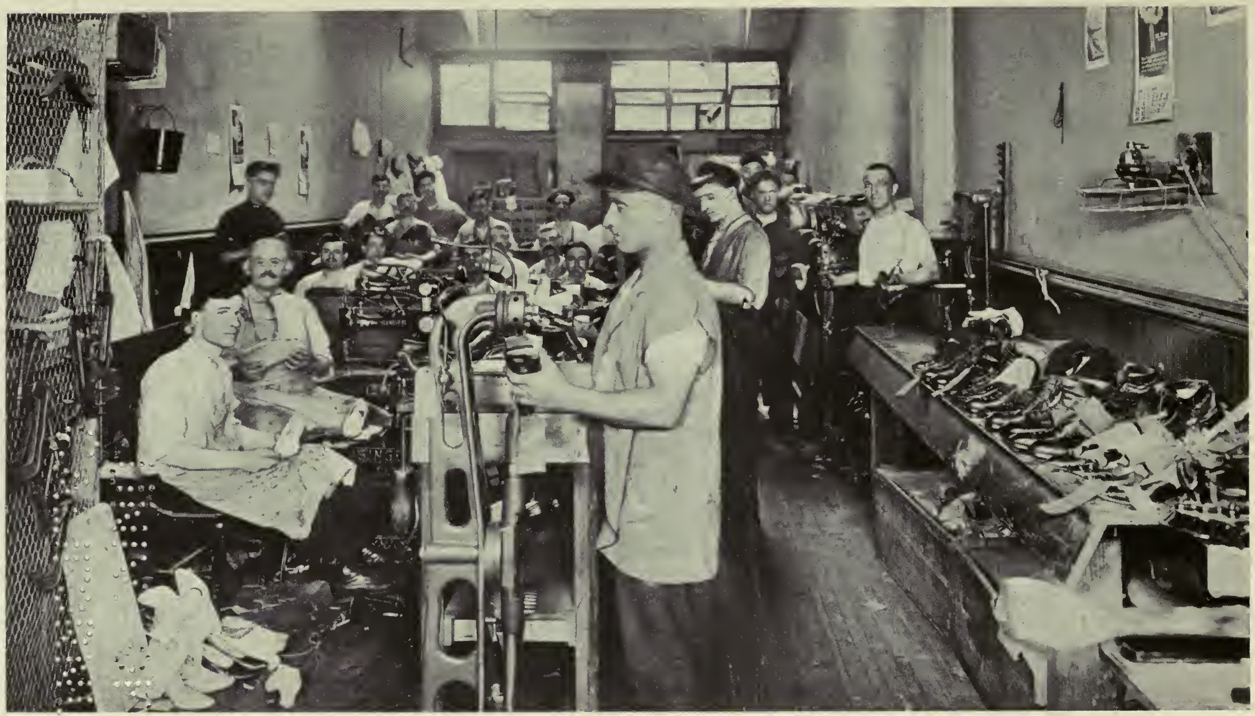
In a large shoe factory the magnitude of manufacture necessitates separate departments for finishing and treeing. The special part of finishing that is of greatest interest is tip repairing. In the passage through the factory the vamp, the linings, the toe box, and the tip have been brought together in the completed toe of the shoe. In lasting and working upon so many thicknesses, especially with the patent leather tip now so generally in use, the shoe comes to the finishing room in most cases with the tip scratched or otherwise injured. Slight injuries are repaired by rubbing down by hand or by machine brushes. In case of a serious injury the old enamel or varnished surface is sandpapered entirely off, and a new coat of varnish is applied by hand. Tip repairing has been essentially hand work, and is usually done by women. Some factories now use a tip repairing machine. The process demands minute inspection, patient application to repairing an injury, deftness of touch, and good judgment.

Treeing is the work done in making a shoe conform perfectly to the shape of the last and of restoring the original finish of the leather, after the passage of the shoe through many hands. The last is drawn out, tacks or inside imperfections are removed, and bottom linings or heel pads are inserted. The shoe is then placed upon one of the tree arms. Dirt or other materials that may have adhered to the surface in making are removed by a brush or by washing with a cleaner. An oil dressing is applied to fill the pores of the leather. In some cases the leather is restained. When the surface of the leather has been fully restored the shoe is ironed upon the tree to give it perfect and permanent form. Ironing consists in rubbing the surface of the shoe, by hand, with a warm or hot iron, to smooth and shrink it to shape. The process is a very important one, requiring great care and some strength. It is performed regularly by men.

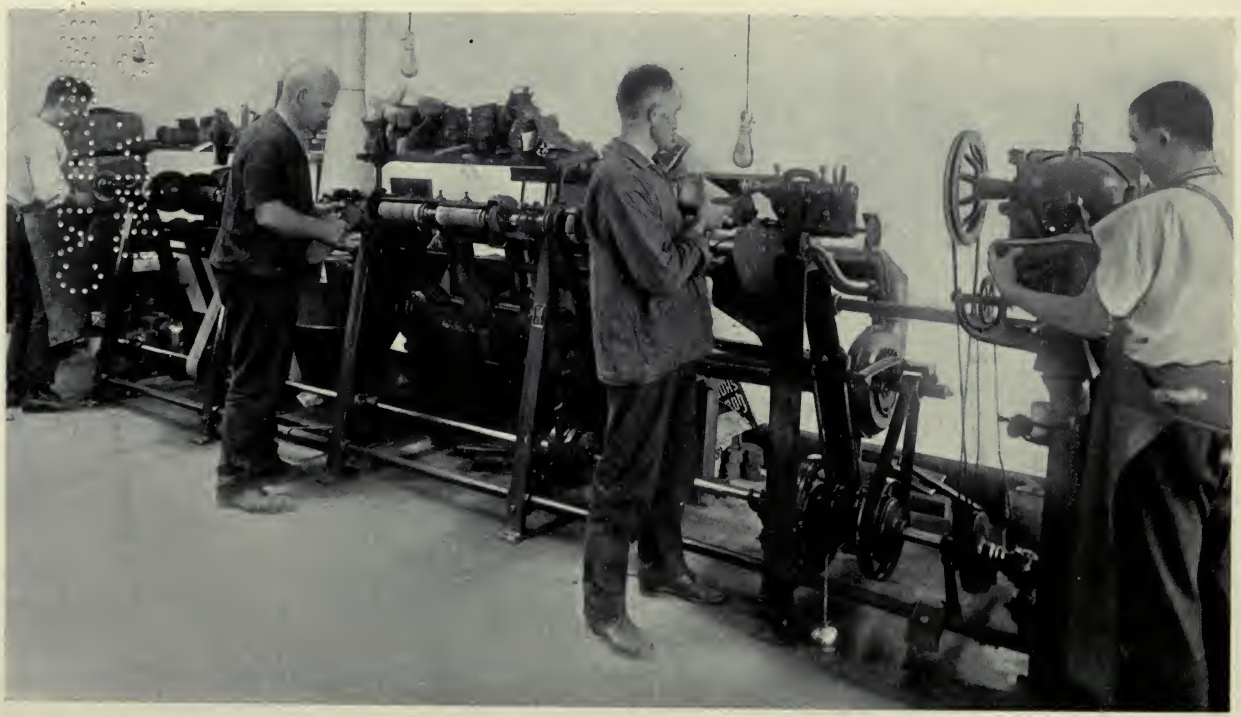
Opportunities for the Handicapped in Finishing and Treeing. The work of both finishing and treeing may be done by persons seated. Two good hands would be necessary in treeing. Finishing might be performed with one natural hand and an effective artificial appliance. Good eyesight would be needed in each process. Bodily injury that would hinder one's free movement on a seat would incapacitate a person.

The processes are learned by work upon them, under instruction, in a small factory or in the department in a large factory. The 'treeing man' ought generally to be familiar with the nature and tanning of leather and with shoemaking processes, to correct defects in material or in manufacture.

In the case of men there may be promotion from finishing to treeing. Working conditions in the finishing and treeing rooms are not objectionable. There is some slight dust from polishing machines, but hoods draw most of it away. There is some dust from the hand use of sand paper in tip repairing. The use of leather stains, oils, and polishing materials results in no special injury. On the other hand, working upon various colors and kinds of highly polished leather makes the several processes enjoyable and attractive to most operators.



Shop of the Philadelphia Shoe Repairing Company



Men working at a motor-drive set of shoe repairing machinery

XI. The Shoe Repairing Industry

The individual shoe cobbler is still found in almost every community, but in recent years repairing has become a special branch of the great shoe industry. It is now a shop industry in itself. There are approximately 50,000 shoe repair shops in this country, with an annual business of fully $300,000,000. These range from the shop in which one man does handwork to the shops conducted by retail stores and the large independent shops which have machinery and employ a considerable number of workers. Probably nearly 20,000 of these larger shops are fitted out with modern shoe machinery. Such machinery is manufactured especially for repair work and is simplified since it must sometimes be operated by unskilled workers or by workers who have not had experience in the shoe factory. Usually the machines are all set on one motor-drive shaft along one side of the shop, and comprise the lockstitch sole sewing machine, the leveler, trimmer, edge setter, and burnishing and polishing brushes. A shop may have several sets of machines on each of which a team of men usually works. Such a shop may employ from twenty-five to thirty-five men and may repair from 60,000 to 70,000 pairs of shoes a year. A few shops employ as many as sixty or seventy men. A tag system is used resembling that of a regular factory. In a small shop each worker may be capable of doing all the repair processes. In the large shop the work is subdivided. As many as seven men, each doing a particular process, may work at the same time on the machines of the shaft.

Some such concerns call for shoes at the homes of customers and return them after making the necessary repairs. In many of the shops a shoe shining department is maintained, and nearly all of them sell shoe supplies. In some western communities steam laundries have established shoe repair departments, since their wagons can collect shoes upon their regular laundry trips.

There are now over eighty local organizations of shoe repairers in the United States, and the increasing cost of leather and footwear during the war has given a great impetus to the industry. An investigation into machine shoe repairing throughout the country has recently been made by Mr. Frank W. Whitcher of Boston, some of the results of which may be summarized as follows: [1]

1. Machine shoe repairing has supplanted hand repairing to the extent of eighty per cent. in the Middle States and Northwest, fifty per cent. in the Far West, seventy-five per cent in the South, and ninety per cent. in the East.
2. The Number of men employed varies from the boss and from one to three or four men in shops having a single machine repair outfit to the city shop having several outfits and using from thirty-five to forty men.
3. The average shop repairs from twenty-five to forty pairs of shoes per day, or ten to twelve pairs for each man working.
4. The business of the average shop amounts to $1 on each pair of shoes repaired, being from $25 to $40 a day or from $6,000 to $12,000 a year.
5. The yearly percentage of increase in repairing since the outbreak of the war has been from fifteen to forty per cent. in the Middle States and Northwest, fifty per cent. in the West and South, and from twenty-five to forty per cent. in the East.

The hand shoe repairer may easily learn machine shoe repairing. He may secure an equipment of machinery, hire helpers if necessary, and open a repair shop. Men of mechanical ability may be taken into the repair shop to learn both hand processes and machine operations. From these machine operations they may pass directly into corresponding work in the shoe factory. Less frequently, workers in the factory leave and open shops of their own.

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[1] See article on '$300,000,000 Spent for Shoe Repairs' in *The Shoe Repairer and Dealer* for August, 1917.

Steps are being taken in several places to provide special training in shoe repairing, for returned soldiers and others, because of the recent scarcity of men for the repair shops. Plans are not yet formulated and the early closing of the war may delay them, but it may be stated that a well-known shoe machinery repairing company has contemplated turning one of its local shops into a repairing school to be conducted under Government or other auspices for the benefit of the entire industry.

In the small shop, employing few workers, and doing mostly hand repairing, the earnings may vary from two to five dollars or more a day. In the large shop, in which repair work is done mainly by machinery, the operator earns about the same as he would in the same processes in the shoe factory. Employment in repairing is fairly steady through the year in most communities, but it is somewhat reduced in the large town or city during the summer season.

Opportunities for Handicapped Men in Shoe Repairing. Disabled men may become individual shoe repairers even if having only one good hand and an efficient appliance for the other. Hand repairing is regularly done seated. At present machine repairing is done standing, but seats might easily be arranged at the machines as may be done in the shoe factory for women and disabled men. The handicapped man will not meet the difficulty of factory speed in the shoe repair shop, except at times in team work, so that he may enter it even if he is not capable of making a large daily output. One or more men who have physical handicaps and who are familiar with shoe work, or who may learn it in their industrial reeducation, might successfully open a machine shoe repair shop in any community. Repairing machinery may be leased or purchased outright at comparatively low cost.

The Trade Promotion Bureau of the National Leather and Shoe Finders' Association, at St. Louis, has recently taken up the matter of the advancement of the shoe repairing industry. A letter from Mr. George A. Knapp, Secretary-Director of the Bureau, to the writer is herewith reproduced:

> I have your esteemed favor of November 8, and I want to thank yourself and Mr. Whitcher for giving me this opportunity of briefly laying before you the work which the Trade Promotion Bureau, of which I am Director, has undertaken. This Trade Promotion Bureau is supported by the members of the National Leather & Shoe Finders' Assn., which is comprised of manufacturers, tanners and jobbers, who supply the materials used by the shoe repairers throughout the United States. We have felt for a long time that the shoe repairing service which the public has been receiving is not of the proper caliber. We are convinced that shoe repairing is just as important to the public as other repair service, because when it is properly done it doubles the life of a shoe, and is, from this standpoint, of great economy to the public. Therefore, our Trade Promotion Bureau has, for the past nine months, been carrying on a propaganda that has for its ultimate object the advancement of the shoe repairing industry. We have been striving during this time to impress upon the shoe repairers that good workmanship and good materials constitute a quality job of shoe repairing and we have been trying to convince them that if they will give this kind of shoe repairing service to the public they will advance their interests and make shoe repairing a more popular service than it is today. We have also tried to get the shoe repairer to improve his business policies by introducing salesmanship, by making his shoe repair shop a supply depot, by keeping an account

of his business and by advertising the service that he can render, in his neighborhood. In order to bring these suggestions to the shoe repairer in concrete form we have gotten up some advertising suggestions and we have sold over 200,000 of these to the shoe repairers at cost. We have also prepared an account book which we sell to the shoe repairer at 50 cents. This book is large enough to take care of two years' business, and hence costs the shoe repairer but two cents a month. We have issued several pamphlets and written a number of letters to the shoe repairer, urging these improvements in his business. At the present time I am preparing a pamphlet that will show the interested shoe repairer just how important his service is to the public and that it should take its place in line with other neighborhood service.

I also wish to state that at the present time we are trying to interest the Trade and Manual Training Schools throughout the United States in adding shoe repairing courses so that the pupils in these schools may be taught the art of shoe repairing. We have done little along this line as yet, as I have been unable to obtain a list of these Trade Schools, but I now have assurance from the Government that they will furnish me a list of these schools and as soon as I get this list I will take this matter up with each of these schools direct.

We know for a fact that shoe repairing is an honorable occupation and that it may be made a very remunerative one, and we believe that the time has come when shoe repairing will soon take its stand alongside of such service as the laundries, the clothes pressers, and other services which cater to the general public.

Crippled men can do this work just as well as men who have all their limbs. I believe that a man with one hand can do just as good shoe repairing as a man with two, and the loss of his lower limbs would not affect his efficiency at all. Of course, one would have to have good eyesight, as we are now using power machinery in shoe repairing and it would be dangerous to permit blind people to enter the industry.

XII. Training Employees in the Shoe Industry

Shoemaking is a trade, with many specialized divisions. Some of these divisions, such as the simpler operations in the various rooms, are distinctly unskilled operations; others, like cutting, welting, and trimming edges, are highly skilled trades. The first kind calls for a very brief period of learning, sometimes a few days only; the other division includes processes requiring in many cases several months or even years for learning. The operator may learn several related processes, but in the large factory he remains essentially a worker or an expert in one.

In this country, as has been indicated in the preceding pages, the shoe operator as a rule learns his trade by actual work on factory processes. In a small shoe establishment, and quite regularly in a country town, inexperienced persons may be taken in to learn most processes. Persons thus learning branches of shoe manufacture quite often enter the large factories as experienced operators. In the large factories, especially in the great shoe centers, inexperienced persons are taken in only for the minor processes, and more often in the stitching than in other departments. There is quite a steady movement of the more highly skilled shoe operatives from factory to factory, and from one shoe center to another.

In European countries, on the other hand, there are numerous publicly maintained schools of shoemaking, in which one may learn 'cobbling', hand shoemaking, and factory operations. In America the industry is almost entirely one of machine work. Hand work has been reduced to a minimum. Even repairing is becoming more and more a set of machine processes. Our shoe factories have not yet established anything like the vestibule schools now being opened in some other industries, since the training of shoe workers has not yet been a serious problem, like that of the securing of a sufficient number of workers of fair intelligence and ability to enter the industry in war times. Superintendents, foremen, and special instructors, however, in a few factories train employees in small groups in the work of their departments.

In several large shoe centers private schools for shoe workers have been established. The work upon which operators learn usually consists of low grade shoes made by the school for factories, on a contract basis, or upon shoes manufactured from materials of second quality, bought at a low price from supply factories or from shoe factories. Persons wishing to learn a process of shoemaking are taken on rather as helpers at first in that process, giving their time and paying a fixed tuition, such as thirty or sixty or eighty dollars, without special regard to the time required for learning. The time spent in learning, however, may run from one to seven or eight months. Operators run the same machines, though sometimes second hand, as are used in the shoe factory, and generally become capable of entering factories as fairly efficient workers.

A few towns and cities, in cooperation with shoe and leather manufactures, have established courses in shoe and leather subjects in the continuation school or the public school system. These courses, however, are mainly attended by persons already working in factories and leather houses and seeking additional training to increase their efficiency and earning capacity.

The instructors are superintendents and experts in the trade who have been given special training for teaching. The establishment of such courses marks a great advance in the shoe and leather industries. Following is a statement on the Shoe and Leather Course of the Boston Continuation School, prepared by Mr. Owen D. Evans, Principal of the school:

> In 1910 with the cooperation of the New England Shoe and Leather Association the Boston Continuation School started a voluntary short unit course on the shoe and leather industry. Since that time the course has been given once or twice each winter. To date a total of over 300 men in the shoe and leather industry have successfully completed the work. The men who take the course range from eighteen to twenty-five years of age; most of them are high school or college graduates. Their work lies on the distributing side of the industry rather than in production. The sessions are two hours each, twice a week during working hours for twelve weeks. A small tuition fee is charged for persons not residents of Boston. Usually the employer pays the tuition fee. The work consists of lectures, demonstrations, class discussions, varied by frequent trips of investigation and inspection to tanneries, stock rooms and factories.
>
> The detail of the typical twelve weeks' course is indicated by the following schedule for 1918, in which lectures are given by the instructor unless otherwise specified:
>
> 1. Brief historical account of leather making. Trade centers in the United States. Sources of hides and skins. Methods of curing.
> 2. Classification of hides and skins according to age, source, injuries, and 'take-off'.
> 3. Discussion of hide reports in trade papers to bring out above points. Merchandising of hides and skins. Chemical and anatomical structure of skin as applied to unhairing, fleshing, and liming.
> 4. Trip to New England Dressed Meat and Wool Co., Somerville. Killing of cattle and sheep. Care of hides in hide basement. Scouring and painting of sheepskins. Wool pulling and making of pickled sheepskins.

5. General outline of tanning operations from start to finish. Layout of tannery.

6. Chemical demonstration of action of tanning materials on hide-substance. Details of vegetable tanning and study of vegetable tanning materials.

7. Mineral tannages, chrome, alum, and combinations. Oil tannage. Details and processes.

8. Trip to the Beggs and Cobb plant at Winchester. An afternoon spent in seeing what has been taught. Principally chrome work.

9. Finishing operations. Patent leather. Preparation of varnishes.

10. Trip to American Hide and Leather Co., Woburn Highlands, including a brief visit to the Beggs and Cobb patent leather shop.

11. Lecture, Tannage of goatskins, also manufacture of sole leather.

12. Trip to Benz Kid Co., Lynn.

13. Talk on South America by Mr. H. G. Brock, Special Agent of the United States Bureau of Foreign and Domestic Commerce.

14. Tannage of Sheepskins and Calfskins, also a half-hour talk on the Far East by Mr. Clarence E. Bosworth, Special Agent of the United States Bureau of Foreign and Domestic Commerce.

15. Talk on Sheepskins and exhibition of stock by Mr. L. Y. Stiles at the Sheepskin Department of the A. C. Lawrence Co.

16. Brief outline of history of shoemaking in the United States. Development of machinery and the modern factory. Steps in manufacture up to stitching room.

17. Leather remnants, examination of stock at the C. G. Flynn Co., and talk by Mr. Battey on uses of various kinds of remnants.

18. Illustrated lecture on history of shoes by Mr. Wm. F. Hall of the Publicity Department of the United Shoe Machinery Corporation.

19. Talk and exhibition of calfskins at Calfskin Department of the A. C. Lawrence Co. Talk on 'Tanning,' by Mr. L. F. Peabody; 'Selling the Product,' by Mr. G. N. Bankhardt.

20. Trip to Stetson Shoe Factory, South Weymouth. High grade men's welts.

21. Talk on Shoe Selling and the Manufacture of Rubber Heels by Mr. William Noll of the Foster Rubber Co.

22. Shoe Findings, Talk and Exhibit by Mr. S. R. Nichols of the Frank W. Whitcher Co.

23. Trip to the Thomas G. Plant Co., Jamaica Plain. Women's welts, McKay's, and turns.

24. Brief summary of shoe manufacture by the instructor. Remarks by Secretary Anderson of the N. E. Shoe and Leather Association.

Presentation of certificates by Principal Owen D. Evans of the Boston Continuation School.

The Boston Continuation School conducts classes in several local shoe factories, which are of the nature of part time education. In these courses boys and girls from fourteen to sixteen years of age are taught subjects related to shoe manufacture, and Americanization, citizenship, and hygiene. The teaching of factory processes is at present left to the factory itself.

Training Minor Executives in the Shoe Factory.[2] The continuity and activity of an industrial organization depend in the highest degree upon trained executive control. Formerly executives in the shoe industry learned their duties mainly by experience in the offices of a factory, with observation in the departments of shoemaking when such knowledge was necessary. All such means of preparing young people to fill important office or department positions take considerable time and are often costly to a firm. Frequently it is found that the person to whom the necessary period of experience and observation has been allowed is after all unfitted to bear the responsibility later imposed upon him.

There has recently been introduced in shoe manufacture a most interesting method of training minor executives, who will provide the higher executives as the years go by. This method parallels the vestibule school in industry. It is intended especially to shorten the time which is ordinarily required for those who enter the employment, planning, or production departments to become acquainted with the organization, policies, and methods of the company. An expert instructor is provided who has charge of classes organized from young persons just entering the firm's employ or from others already in service who may have shown desirable qualities and ability for leadership. All receive pay while learning. The period of instruction runs from three to four weeks, varying somewhat according to the special subjects needed by individual members of the course. Instruction is given by means of lectures, demonstrations, use of a special museum, reading, visits to factory departments, and special research problems. The lectures are based on a check list prepared by an investigator who spent several months studying the work of the plant. Special stress is laid upon the relation of the work of one department to another and upon a correct understanding of the fundamental policies of the company. The leading topics of study are substantially as follows:

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[2] For a complete description, see 'Training Minor Executives in a Shoe Factory', by Roy Willmarth Kelly, Industrial Management, October, 1918.

1. The purpose and explanation of the instruction system
2. The history and organization of the firm
3. The organization, functions, and routine of the service department
4. The instructions given to a foreman
5. Company system, throughout departments
6. Fundamental ideas on which the work of the company is based
7. Individual system and technique
8. Personality
9. Tact and psychology
10. Methods of shoemaking
11. Elements of report forms
12. Theory of organization and management
13. Special technical topics for particular students
14. Observation or practice in actual factory work or processes

Handicapped persons may be admitted to these courses who are qualified to do office work, act as time study men, enter the employment department, or perform other executive duties.

Training or Qualities Necessary for Special Factory Positions. The superintendent of a shoe factory or of a department or room must be first of all a manager. He need not necessarily have exact knowledge of processes, but he must know much of resources, materials, equipment, employees, and of methods of efficiency and improvement in employment conditions. He must be able to work through subordinates and yet keep a firm and helpful hand on the activities of manufacture.

The superintendent usually comes to his position from the business side of the industry. Young men are trained for this work in some factories by a period in office service, of from six months to several years, followed by service in the factory long enough to make them familiar with the general features of manufacture. They then usually become assistant superintendents.

The superintendent's annual salary may vary from some hundreds of dollars in a small factory or department to many thousands of dollars in the great corporation.

The shoe foreman, on the other hand, rises from the bench or is promoted from the machine. He must have intimate knowledge of processes and be able to train employees in them; he must be able to select operators for his department and to make their work efficient; he must be a master of method, of handling men at work, and of maintaining discipline in his room, tactful, firm, friendly with all, yet not forfeiting their obedience and respect.

The position of the foreman is exacting. He stands between the superintendent and the operator and is responsible for the work of his department. He must keep every employee occupied and the work passing through on schedule time. His pay is usually about the same as that of the most expert operators in his room, varying from $20 upwards a week, reaching $50 or $60 in some cases.

There is probably more change of foremen among shoe factories than of other officers or employees.

Forewomen are employed in divisions of the stitching room or in small departments in which the employees are mostly girls or women.

Some factories have, in addition to superintendent and foremen, a person whose special duty is to examine all work being done in a department for its quality of workmanship and another person who observes all work for its quantity, so that each room is held up to the standard set by the factory both in grade and volume of product. These persons are practically assistants to the foremen, yet responsible to the factory management only. With them, the foreman can give his time more fully to training and supervising employees.

The quality and quantity men have about the same rank and pay as foremen.

Some large concerns employ a person skilled in efficiency methods. His work in the factory consists in studying methods and processes so that the best results may be obtained with the least expenditure of time, with the least wear of machinery, and with the most economical use of materials possible. When his duties deal with the operations of manufacture he is usually called an efficiency engineer. He is a specialist in work attended to by the foreman or his assistant in the smaller establishments. In some firms he is known as the head of the planning department and may have from 10 to 30 assistants.

Opportunities for the Handicapped in These Special Positions. The great difficulty in all industry is that of securing executive ability, not only in office managers and their assistants, but in factory superintendents and foremen. There is quite certain to be an improved class of foremen, and similar workers, throughout American industry as the chief result of the rehabilitation of handicapped men after the war. In the future a large per cent. especially of foremen in industry will come from the ranks of the disabled soldiers. Many of them will have had superior education and pre-war experience and training, and may learn the nature and routine of certain lines of manufacture and become foremen where physical activities will be at a minimum and mental activity at a maximum. Previous training in shoe manufacture will then be a great asset for one who wishes to reenter that occupation. Some returned men will become inspectors of work done in the departments of the shoe factory. They may also become quantity men and quality men and efficiency experts in the industry.

Such men may have lost both legs and an arm or hand, and have other injuries that prevent manual labor. But they must have good health, unimpaired mental faculties, good eyesight and hearing, and ability to write and attend to office or workroom details with or without the aid of an assistant.

Promotion. The operator who can perform several processes in shoemaking is usually kept upon the process in which his work is most needed at any time. Frequently a worker showing a special aptitude for an advance operation is put forward to learn it, and given permanent promotion if he becomes expert in it. There is not, however, such a gradation of operations in the departments of the shoe factory as to offer promotion regularly or to the many. The most conspicuous promotion is that of a workman who comes to understand the work of a room fully and who has ability to direct others, to the position of assistant foreman or foreman.

XIII. Employment Conditions in the Shoe Industry

Like many other forms of manufacture in America today, the industry is carried on in old and unsanitary factories in some of the oldest shoe towns, and in modern, sanitary buildings in many places. It is found in both urban and rural communities. It draws its employees from the shop and from the farm.

The Sex Division of Employees. At the opening of the European war the sex division of employees in shoe manufacture in this country was substantially as follows:

Male employees, sixty-nine per cent.

Female employees, thirty-one per cent.

Boys under eighteen years, one-seventh or fourteen per cent. of male employees

Girls under eighteen years, one twenty-fifth or four per cent. of female employees

In factories making mostly heavy shoes or men's wear, however, the proportion of male employees ran somewhat higher than the sixty-nine per cent., and that of female employees lower than the thirty-one per cent. On the other hand, in factories making women's, children's, and infants' footwear, there would have been found some increase in the percentage of female employment with a corresponding decrease in the male.

As a direct result of the present scarcity of labor, there is a change of probably about ten per cent. in the relative numbers of male and female employees in the industry—about five per cent. less males and about five per cent. more girls and women who have taken up some of the heavier jobs of the factory. In factories making the lighter kinds of footwear the change has no doubt been greater still.

In studying the departments of shoe manufacture we have seen that the more difficult processes and the operation of heavy machines are given regularly to male employees. This is especially true in the cutting department, in some divisions of the stitching department, in the sole leather department, in the gang room, and in treeing. On the other hand, the lighter processes and the simpler machines are regularly given to girls and women, especially in stitching, finishing, dressing, and packing.

The Division of Employees Among Departments. To enable a factory to work as a whole with all operatives in all manufacturing departments equally busy each day, the division of employees among departments must have about the percentages following:

In the cutting room, twelve per cent. of all operatives
In the stitching room, twenty-seven per cent.
In the sole leather room, twelve per cent.
In the gang room, twenty-three per cent.
In finishing, eight per cent.
In treeing and dressing, ten per cent.
In minor factory departments, seven to eight per cent.

At the same time the business offices employ from fifteen to twenty per cent. of the total number of people connected with the industry.

Shoe Manufacture Highly Specialized. Shoe manufacture has become more and more highly specialized in recent years. Each factory can produce a larger output with smaller costs when making only a single or a few kinds of footwear. The large American market has greatly aided in this specialization, and an increased trade abroad has made it still more profitable for the American shoemaker to devote his plant to a single line of product in the assurance that he will find a steady market. We find many factories making men's heavy work shoes, leg boots, walking shoes, or shoes for dress wear; and other factories making footwear for women, children, and infants, exclusively. At the same time we find the long list of factories manufacturing special parts and findings.

Piece and Time Payment. Two-thirds, or about sixty-six per cent. of the processes of boot and shoe manufacture, are paid for on a piece basis, usually at a fixed rate per dozen pairs. Such processes are those in which good work can be done at high rate of speed, and in which the possibility of increased earnings produces a larger volume of work from the shoe operator. On the other hand, where accuracy and care are required, as in the cutting room, and where work is of a routine nature, as in shipping, pay rests upon a time basis.

Seasons. One of the chief objections to entering shoe manufacture is the fact that it is largely a seasonal employment. The busiest seasons are the fall and winter; the least busy season is the summer, with an average idle period of from three to eight weeks, coming usually in or around the month of July. As has been said earlier, the progressive shoe manufacturers are making great efforts to obtain orders far enough in advance, and to study trade conditions, so that a year's steady employment may be provided for the factory. Large concerns capable of handling extensive contracts may do this more easily; the small concern with a limited trade must adjust its output to its volume of trade and suffers usually from an idle season.

In a few rare cases factories having accumulations of orders or large war contracts, as many factories have had recently, are able to make a twenty-four hour day, with three full shifts of employees working in eight-hour periods.

The Monotony of Shoemaking. The working condition in the various rooms of the shoe factory and the effects of working upon various processes have been treated at some length in the sections of this Bulletin dealing with factory departments. It remains to speak of the ever-present feature of factory employment—monotony. Like those of many other kinds of manufacture, the machine processes of shoemaking are monotonous. The hand processes are in general of a lighter and less wearing nature, and are not so distinctly characterized by monotony. Operating an automatic machine, however, upon which materials or parts of shoes must be placed and controlled in an unvarying time period, is depressing and wearing for the operator. In a sense he becomes a part of the machine until he may almost seem to have little mental or physical activity aside from it.

There are several possible offsets to monotony in shoe manufacture. One is an incentive to speed, which, while in itself a wearing element for the workman, has a speeding up effect upon him in the case of payment by piece. He works faster, and in many cases accomplishes a full day's work in less than a full day's time, thus gaining for himself some hours of the working day to spend outdoors or at home. It is a common thing to enter the gang room of a shoe factory, for instance, towards night and find some machines idle because the operators upon them have performed their work on the lots of shoes passing through the room on that day.

A second offset is found in the advantage to the operator of learning to run more than one machine, so that at times he may be transferred from one to another. It is also a relief and often a pleasure to the mind of the worker to have to handle leathers and other shoe materials of high grade and finish.

Another means of lessening monotony lies in the operator's being able to care for his own machine, to understand its parts, or to suggest improvement upon it. This kind of ability, which is much sought after in the shoe factory, often leads to promotion and to work upon more important machines.

In some factories the routine of the day is broken by a rest period in the morning and in the afternoon. In a western factory, which makes supplies for the shoe trade, there is a morning and afternoon recess for employees. Lunch is served during the recess. Some of the employees work as waitresses. In a number of shoe factories there are now rest rooms open to women at all times of the day.

Service Work in the Shoe Factory. Some large factories conducted under modern conditions take measures for the occupational and social welfare of their employees. They provide classes for training, in some features, at least, of the work of the factory; separate rooms for rest and recreation; dancing, and social clubs for male and female employees; libraries equipped with books and magazines relating to shoe manufacture, and with general literature; restaurants conducted on a cooperative basis, or at low rates, so that employees can afford to patronize them; medical attendance and equipment; and sometimes elaborate parks, playgrounds, and club houses.

The best summary of service work in the shoe industry is to be found in the report upon *Employers' Welfare Work,* published by the Bureau of Labor Statistics, as follows:

> The .... Shoe Company has done much to improve working conditions for its 5,000 employees. The huge factory is built in the form of a hollow square, so that all the workrooms are well-lighted. On the top floor, where the shoe leather is cut, the roof has saw-tooth skylights to increase the light. The ventilation throughout the building is admirable, and every effort is made to keep down dust. The lavatories are very

sanitary and clean. Individual lockers of perforated iron are placed about in the workrooms near the machines, and are turned over to employees on their making a small deposit—enough to cover the cost of the key. There is a check-room for umbrellas and wet garments. Separate elevators are installed to transport the women employees to the upper floors. The company has a lunch counter for the employees, where food is sold at cost. Employees who bring their lunches eat them in the workrooms.

Apart from good workroom conditions the company conducts recreation work—the name it gives the usual welfare work. The ground around the building has been converted into a noonday-rest park for the employees, with a beautiful, trim, green lawn and flowers. There is besides a roof garden covering over half of the roof space. Part of this is reserved for women and part for men, with separate stairways leading to each section. A dance hall for women open at noon and on special occasions in the evening, a pool room and bowling alleys for men, open every evening after working hours until ten o'clock, give the much-needed amusement. The men pay a small fee for the use of the tables and the alleys. A handsomely furnished reading room, with attractive ferns and flowers from the company's greenhouse, has been opened to the employees. There is a branch station of the City Public Library here, besides books owned by the company and numerous weekly and monthly periodicals.

A woman physician, constantly in attendance, has the medical care of the employees under her supervision. There are rest rooms and an emergency hospital, with a nurse regularly employed, in the building. Twice a week an oculist spends the forenoon at the factory and may be consulted free by the employees. He fits them with glasses at very reduced prices.

The company, with the aid of employees' dues, maintains the Relief Fund Department. Out of this fund, sick, accident, and death benefits are paid. There is at present over $5,000 in the treasury. The dues are ten cents each week for adults and five cents for employees under twenty years of age, and they are deducted from wages by the paymaster's department. In case of sickness or accident the members receive $7 and $3.50 a week. No member can draw benefits longer than seven weeks in one year. Benefits do not become due until the member has been incapacitated one week, except in case of severe injury. At death $100 or $50 is paid the beneficiaries of the deceased, according to the amount of the weekly dues. A medical examiner is employed to report upon the condition of disabled members and to decide upon the members' claims for benefits. The administration of the relief fund is entirely in the hands of the company, and all the receipts of the fund are held by the company in trust for the relief department.

XIV. The Training of Disabled Soldiers in the Shoe Industry in Foreign Countries

Shoemaking is one of the most popular trades that have been taught disabled soldiers and sailors, in the course of the war, in Canada and across the sea. It has, however, taken the form of shoe repairing and hand shoemaking in the main, with some little training in shoe factory processes. The reason for the popularity of the trade is that the work is done seated and does not require very hard physical efforts, and that the trade can be carried on either in a workshop or at home, in the country as well as in the city. It does not require much initial expense to start a small cobbler's shop, and the cobbler, even in the smallest village, is assured of a fair revenue in addition to his pension. The trade therefore strongly appeals to men affected with injuries of the lower limbs, particularly those of country origin who wish to return to their villages. The French National School of Agriculture, at Grignon, has, among its reeducation classes, one of shoemaking, as this is considered as one of the possible 'subsidiary' occupations for a small farmer. In some instances, training in shoemaking is combined with that in harness-making.

Training in shoemaking or shoe repairing has been carried on in Canada, in the military hospitals of Montreal, Halifax, Toronto, Saskatoon, and other places; in a number of technical schools, such as the Montreal College of Pharmacy, the Nova Scotia Technical School at Halifax, and Queen's University at Kingston, Ontario; and in numerous factory workshops, such as those of the

Union Shoe Repair Company, Toronto, the Wood Shoe Company, the Williams Shoe Company, and the Askew Shoe Company, of Hamilton, Ontario.

Training in the industry has been given in England in the military and orthopedic hospitals, such as the Royal Pavilion Hospital, Brighton, the Convalescent Hospital, Roehampton, and many others; at technical colleges and institutes, such as the Brixton Polytechnic Institute and the historic Cordwainers Technical College of London, and in shoe shops and factories throughout the country. In France similar training has been provided in the reeducation schools of Paris and other towns and cities and in technical schools and workshops. The industry has been taught to disabled men in several Belgian schools and in a considerable number of Italian schools, as at Turin, Spezia, Pisa, and Milan. Germany has taught shoemaking to many of her returned soldiers in the workshops of the Army Clothing Department and in the hospitals and schools of many communities. Austria-Hungary, also, has given special attention to teaching the making and repairing of footwear in her reeducation and trade schools.

The work done in all of these countries in various lines of reeducation is of very great interest to America in her problems of reconstruction. We shall here, however, give space only to a short presentation of methods and accomplishments in France and Great Britain.

A French official census, covering fifty-six reeducation schools, has shown that on June 30, 1916, of 2,846 disabled soldiers undergoing training there were 466 shoemakers, this being the largest single trade group. In the National School at St. Maurice, Paris, 152 men attended the shoemaking section during the first two years when the total attendance of the school was 803; of the 152, there were 143 men with leg or foot injuries; 55 men were former peasants. In the school of the Rue du Epinettes, 60 men, out of a total of 150, were attending the shoemaking shop; 143 shoemakers had been placed by the school, up to June 1, 1917, out of a total of 340 graduates in all trades. Of these shoemakers almost all were suffering from leg injuries. Former peasants, numbering 27, formed the largest preoccupational group. In the Lyons school, the first reeducation school created in France, shoemaking at once proved the most popular trade. There were in this school, in the first year, 50 men in the shoemaking shop, of whom 29 were former peasants. At the Tourvielle branch of the Lyons school on May 31, 1917, 60 shoemakers were graduated, out of a total of 129 men for all trades, of whom 34 were former peasants. Almost all of these were cases of lower limb injuries, 35 were cases of leg amputation, one man had both feet amputated, and two were legless.

Dr. Borne, the noted French authority, in his general reeducation scheme, gives the duration of apprenticeship in shoemaking as from one year to one year and a half. In actual practice, however, both the duration and the methods of training vary from one school to another. The apprenticeship is generally intensive; after a short time the student, while at school, is able to do useful work; many of the schools are, therefore, in a position to fill outside orders and to be to a larger or less extent self-supporting. Thus, while in Nancy the apprenticeship is of six months, it lasts from twelve to fifteen months at the Montpellier School. At Bourges, the apprenticeship is from four to six months for repair work, and from ten to twelve months for the making of new shoes. At the Saint-Maurice School, the length of apprenticeship is, on the average, five months for repair work, and eight months for the making of new shoes. The course is divided into three sections of practical instruction. A month's training is allowed for plain machine stitching, seaming, welting, and soleing. At the end of five months apprentices should be able to re-sole shoes, both pegged and hand-sewn. Complete shoes are made by men of average ability by the end of eight months. The men receive, in addition, theoretical instruction in branches essential to carrying on the trade, such as study of foot-forms, a knowledge of leathers, and the taking of measurements.

At Port-Villez, the shoemaking shop is divided into two sections: repair work and the making of new shoes. During the first two or three months, all students work at repairs; by the end of one week the apprentice is sometimes able to perform useful work. The majority, however, pass into the shoemaking section. After five and one-half months, men who came from other trades are able to make perfectly good military boots. All the orthopedic boots for the Institute are made by the apprentices of the shoemaking shop.

At the Tourvielle School, the apprenticeship is from ten to fifteen months. The apprentices are first taught to make their own shoemaker's stirrup and glove. In doing that they learn how to make a waxed thread and to use the awl. Next they are directed to assemble and sew by hand the parts of a pair of slippers, which they are allowed to keep for their own. Coarse brogans are their next problem and then fine boots. After a month's training, the student can feel that he is a shoemaker—he has made a pair of shoes for sale, with the help of the teacher of the course. After ten months or a year, he needs only some final lessons on cut and style, on the selection of material, on the way to obtain customers and on price fixing, to be able to get along by himself. If his physical condition permits, he can also have some practice with shoe machinery, which has been supplied to this school by the United Shoe Machinery Company of France.

In Great Britain, both the making of hand-sewn shoes and the factory shoemaking trade have been included in the so-called 'special trades', in which the training and employment of disabled men are of considerable importance and require special regulations. These regulations have been worked out for each trade by a Trade Advisory Committee formed of representatives of employers' organizations and labor unions.

The report of the Trade Advisory Committee on the Hand-Sewn Boot and Shoemaking and Boot and Shoe Repairing distinguishes between two classes of disabled men: (1) Those unable to stand continuously at their work, and (2) those able to stand continuously. For the former, the report recommends training in all branches of hand boot and shoe repairing, and in riveting and finishing; for the latter, training in hand work is recommended as the best introduction to machine boot and shoe repairing, and also training in the use of machines used in the repairing trade, in view of the fact that a large amount of repairing is already done by machinery and that this method may possibly grow in the future.

The several processes suitable for the different types of disability are as follows:

(1) Hand-Sewn Boot and Shoemaking and (2) Hand Repairing. This work can be done sitting and would be quite suitable for a one-legged man. Full use of both hands and arms is needed, but the loss of one or two fingers would not disqualify. Good eye-sight is required. Men suffering from shell-shock may in some cases be likely to find this a suitable occupation. It is not recommended for men with a tendency to consumption.

(3) Machine Repairing, which includes three processes: (*a*) *Bench Work.* This is done either standing or sitting, but in other respects the requirements are the same as for hand work. (*b*) *Machine Stitching.* It is standing work, and often

a treadle has to be compressed by the right foot to start the machine and hold down during the operation. Both hands are required. The work is light and there would be only slight vibration. (*c*) *Finishing by Machine.* It is principally done standing, but the machine can be adjusted so as to be worked while sitting. Use of both arms and hands is required, but little or no movement of the leg or body. The work is not heavy, but it is not recommended for a man with a weak heart or a tendency to consumption.

The training is provided in technical schools or other training institutions, or in some cases in workshops. The duration of the training in a school is not to exceed twelve months, but in exceptional cases it may be completed by an additional six months' training under an approved instructor in a workshop. The period of training in a workshop is eighteen months for shoemaking combined with shoe repairing, and twelve months for shoe repairing only.

The first month of training is, in all cases, a trial period. If at the end of this period the man proves unsuitable for the trade, his training ceases. The employer is required to pay the apprentice a minimum wage, which, in the eighteen months' course, is fixed at 10*s*. per week during the first six months, 15*s*. during the next six months and 20*s*. during the last six months. In the twelve months' course, the employer shall pay no wages during the first six months, and shall pay 15*s*. per week during the second six months.

One of the first technical schools to institute special classes for disabled soldiers in the making of hand-sewn shoes was the Cordwainers Technical College. The following classes are open:

1. *High Grade Boot and Shoe Making.* This course extends to at least twelve months and covers the following syllabus:

The making of men's and women's hand-sewn boots. The making of sew-rounds. How to take a measure of a customer's foot, and fit up lasts for the same. How to send a measure to the upper maker or manufacturer. The selection and purchase of bottom stock. How to cost the finished work. The anatomy of the foot.

2. *High Grade Boot and Shoe Repairing.* This course extends to at least six months and covers the following syllabus: The methods of repairing men's and women's hand-sewn boots. The repairing of machine-welted boots. The repairing of sew-rounds, etc. Patches,blind stabbing, and other stitching. Grafting, costing materials and work.

In factory boot and shoe manufacture, according to the Trade Advisory Committee, "as a result of the development and use of specialized machinery and tools, many of the processes are of a comparatively simple character, not calling for great physical exertion and suitable for the employment of disabled men of a fair degree of intelligence. The work is not heavy, but requires concentration and adaptability. The operations generally require the full use of hands and arms, but many operations would be suitable for a man with an artificial leg, provided he is able to stand at his work."

The report of the Committee indicates the following processes suitable for different types of disability:

1. *Clicking Department.* For pattern grading, hand clicking and power eyeleting, both hands and arms must be uninjured, but the operations would be possible for a man with an artificial leg. For the clicking press young men are required whose hands, arms and legs are sound.

2. *Rough Stuff Department.* For the cutting press and roller, young men are required whose hands, arms and legs are sound; for grading machines and splitting machines the loss of a leg would not necessarily disqualify.

3. *Preparation Department.* For sole molders, out-sole, and in-sole channeling machines and power skiving the full use of hands, arms, and legs is required; work especially suit-

able for young men; a man with an artificial leg would not be debarred.

4. *Making Department.* For pulling-over machine, control tacking, pounding machine, Blake lining, standard screwing, loose nailer, stitching machine, leveler, heel attaching machine, loose billing, universal slugger, welt sewer, sole layer and rough rounder, young men are required who are sound in both hands, arms, and legs. Hand tacking is also suitable for older men. Work at the rough rounder and welt sewer should be confined to men who have had some experience in the trade.

5. *Finishing Department.* Heel trimming, edge trimming, edge setting, and bottom scouring are suitable for men with an artificial leg, but both hands and arms must be uninjured. Heel scouring and heel burnishing require young and active men whose hands and arms are sound; an artificial leg would not necessarily disqualify.

The course of training in any process shall be divided into a probationary period and an improver's period. The probationary period must, as a general rule, be spent in a technical school, though in exceptional cases the Local War Pension Committee may permit the man to spend it in a factory. The improver's period shall in all cases be spent in a factory.

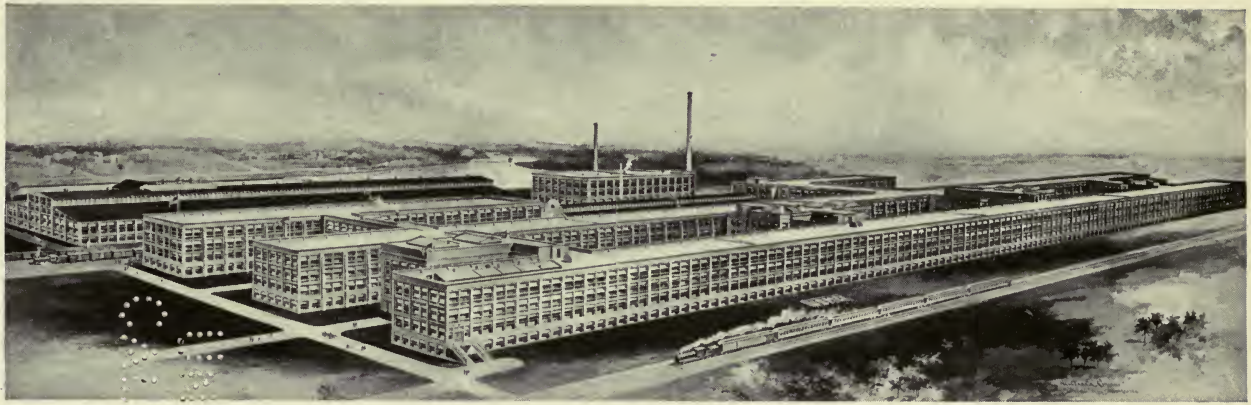
The length of training varies for the different processes. It ranges from twelve weeks for power eyeleting to fifty-two weeks for hand cutting.

During the training in a factory the employer shall pay the man a minimum wage, according to a graded scale prepared by the Trade Advisory Committee, and ranging from 10*s.* to 25*s.* a week.

While undergoing training in any trade, the disabled soldier receives from the Ministry of Pensions the difference between his wages and the pension paid for total disability (27*s.* 6*d.* per week for a private). His wife receives a separation allowance and a maintenance allowance for each child. The Ministry of Pensions assumes the payment of all tuition fees and other expenses entailed by the training.

For every trade there have been created local Technical Advisory Committees, formed of representatives of employers' associations and labor unions, which select candidates for training, examine the suitability of the training offered in the technical schools or similar institutes or in the factories, and receive applications from employers for the supply of men after training.

The question of wages to be paid disabled men after training is to be settled entirely by the Local Technical Advisory Committee, or by Special Advisory Wage Boards which are being created by the Secretary of Labor in the principal towns.



Plant of the United Shoe Machinery Corporation, at Beverly, Mass.

XV. Shoe Machinery

The Number of Processes in Shoemaking. In making an ordinary shoe today there are one hundred and seventy-four machine operations performed upon one hundred and fifty-four different machines, and thirty-six hand operations, altogether two hundred and ten processes. About three hundred different machines are in use in the industry, and the number of processes is on the increase.

The Invention of Shoe Machinery. Shoe manufacture has been revolutionized by the invention of machinery through three-quarters of a century. One machine after another has been perfected until the dexterity of the human hand has been attained. Most of the machines have been invented by shoe workers themselves, after long toil and study upon particular operations. Since the establishment of the United States Patent Office in 1836, about 7,000 patents have been granted on shoe machinery.

There have been three conspicuous stages of development in shoe machinery, as follows:

1. The Upper-stitching Machine, for sewing the top parts of the shoe.
2. The Sole-sewing Machine, for attaching the soles to the uppers.
3. Machine Welting, an improved method of sewing the sole to the upper.

The other machines used in the industry mark steps of advancement in minor processes and features of shoe manufacture.

Making shoes by hand, however, has continued to the present day, though steadily diminishing in importance. On the other hand, shoe repairing has been a hand industry until very recently. In large communities machine repairing has come into practice.

The Wooden Peg: 1815–1857. As early as the sixteenth century heels were attached to shoes by wooden pegs made by hand. Preceding the use of shoe machines a machine for making pegs was invented in 1815. This small invention was a great gain and suggestive of machines for actual shoemaking processes. A pegging machine was invented in 1833 and came into general use about 1857. The pegging machine and the McKay sewing machine revolutionized the industry.

The Rolling Machine: 1845. The first machine widely used in the industry was the rolling machine for solidifying sole leather. Up to this time the shoemaker had been obliged to pound sole leather upon a lap stone with a flat-faced hammer to make it firm and durable for the shoe bottom.

The Howe Sewing Machine: 1852. John Brooks Nichols, a Lynn shoemaker, adapted the Howe sewing machine to stitch the upper parts of shoes, and this machine was first used in Lynn in 1852. The introduction of this machine marked the transfer of stitching from the homes of shoe workers to the factory, marking the first stage of development.

The McKay Sewing Machine: 1858–1862. In 1858 Lyman R. Blake invented a machine for sewing the soles of shoes to the uppers. After improvements this machine was manufactured by Gordon McKay, of Cambridge, Mass., and became known as the McKay sewing machine. This machine was first used in Lynn about the year 1862. It marked the second stage of development in shoe machinery. It is the most important invention of all in modernizing shoe manufacture.

The Goodyear Welt Machine: 1862–1875. In 1862 Auguste Destouy, a New York mechanic, invented a machine with a curved needle for sewing turned shoes. Charles Goodyear employed mechanical experts to improve this machine and it was finally adapted, in 1875, to sewing a welt cut in the bottom of the shoe to the top of the shoe. It became the famous Goodyear Welt machine and marks the third great stage of development in the industry.

McKay and Goodyear were far-seeing capitalists and manufacturers. They improved and patented the inventions of obscure shoe workers who had no means of perfecting their crude machines, and in a large degree created the modern industry, making the country and the world forever their debtors.

Edge-trimming and Heel-trimming Machines: 1877. Machines for trimming the edges of the sole and the outside of the heel of a shoe were first used about the year 1877. These processes were difficult and had previously been done by hand, at very high wages. Hand trimmers, or 'whittlers', as they were called, opposed the introduction of these machines but their uniformity of work and saving to the manufacturer made their use invaluable.

Right and Left Patterns: 1876–1880. Up to about this time, through all the period of which we have written, shoes for both feet were made upon similar lasts, without right and left shape. Both hand shoemakers and factory manufacturers had followed this custom. The purchaser of a new upper of shoes wore them as he pleased, having no right and left form to determine upon which foot each shoe should go. A pair of shoes made on right and left patterns was exhibited as a curiosity in the Centennial at Philadelphia in 1876. Such patterns came into general use about the year 1880.

The Lasting Machine: 1883. Shoe operatives in all lines opposed the introduction of machinery into the industry. They felt that it would reduce the number of workers, shorten the period of employment each year, and make them more dependent upon the manufacturer. The hand lasters were foremost in this opposition. They were strongly organized, and earned from $20 to $30 a week at a time when earnings in most processes were very low compared with present day wages in the shoe factory. Jan Ernest Matzeliger, a young machinist of Lynn, learned to operate a McKay sewing machine and undertook to invent a lasting machine. He was successful, after four attempts, and in 1883 gave the industry what has become the modern 'Consolidated Lasting Machine'. Some of the motions of this machine are like those of the hand and fingers, drawing the parts of the leather into place and fastening them by tacks.

The Pulling-over Machine. This machine was introduced early in the present century. It prepares the shoe for the lasting machine. It centers the upper on the last, draws the parts into place with pincers and fastens them with tacks for lasting. "It is the acme of shoe machinery intricacy and accuracy, and years of study and over $1,000,000 were spent in its development."

Power in Shoe Manufacture. Hand and foot power were long used in the first primitive shoe factories of the country. In 1855 William F. Trowbridge first applied horse power to shoe manufacture in what is now Marlboro, Mass. After that time steam and water power came into general use in shoe factories. In 1890 the electric motor was introduced and has gradually taken the place of the steam engine.

The Leasing System and the United Shoe Machinery Corporation. The leasing of shoe machinery was introduced in 1861 by Gordon McKay. He found it difficult to sell the Blake Shoe Machine to shoe manufacturers and compromised the difficulty by hiring the machines out to them. The leasing system, which was conducted on a royalty basis, enabled the manufacturers to have the advantage both of the use of the machine and of unreduced capital for manufacture. This system has been perfected and enlarged by the United Shoe Machinery Corporation of Beverly, Mass. This corporation now owns a large portion of the shoe machinery in operation in this country. After a long contest in the Supreme Court of the United States the decision has been reached that this corporation is not a monopoly in restraint of manufacture. Without doubt a large proportion of the 2000 shoe factories of the United States exist only by virtue of the advantage of the leasing system of shoe machinery.

The Standardization of Machinery. The leasing system has caused the standardization of shoe machines and processes of manufacture. As a result, the growth of the industry during the last twenty years has surpassed all former periods. Standard shoe machines are now in quite general use in this country and in many factories in other countries. It should be remembered, however, that improvements are constantly being made, and that a process may be entirely changed at any time. The United Shoe Machinery Corporation keeps a corps of expert machinists and inventors constantly at work upon the thousands of patents which it holds. It also maintains a large force of expert 'road men' in the large shoe manufacturing centers. These men install machines in shoe factories and make the larger repairs which are necessitated by wear and breakage. In late years the service of the corporation has been extended to the instruction of operators upon the machines when set up in the factory.

Operating a Complicated Shoe Machine. The operator of a modern complicated shoe machine must understand its parts thoroughly. He must be able to adjust it and make simple repairs, at least, at any time. The operator, then, of most shoe machines should have some mechanical ability, though he usually learns to adjust and repair his machine by actual experience in running it. The operator who has real mechanical ability is worth more to the factory, and has increased earning power under the prevailing system of piece work.

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Bibliography

ALLEN, FREDERICK J. *The Shoe Industry.* Bureau of Vocational Guidance, Harvard University, 1916.

It is the purpose of this book to give the nature, history, magnitude, operations and processes, employment opportunities and demands, and future of the industry, both for those already in it and for other persons, and their advisers and teachers, who may be considering employment in this field of manufacture.

BOOT AND SHOE RECORDER PUBLISHING COMPANY. *The Shoe and Leather Lexicon.* Published by the Boot and Shoe Recorder Publishing Co., Boston, 1912.

BUREAU OF LABOR STATISTICS. *Wages and Hours of Labor in the Boot and Shoe Industry.* Published by the Bureau of Labor Statistics, United States Department of Labor, Wages and Hours of Labor Series, Washington: No. 4, 1890 to 1912; No. 13, 1907 to 1913; and No. 19, 1907 to 1914.

———. *Workmen's Compensation Laws of the United States and Foreign Countries.* Published by the Bureau of Labor Statistics, United States Department of Labor, Workmen's Insurance and Compensation Series, Washington: No. 5, 1914.

DOOLEY, WILLIAM H. *A Manual of Shoemaking and Leather and Rubber Products.* Little, Brown and Co., Boston, 1912.

A popular treatise.

GOLD, GUY D. *The Shoe City Reader.* The New American Association, Brockton, Mass., 1913.

Used to teach shoe workers the English language by means of the terms of the shoe trade.

HADAWAY, J. B., and KAVEN, M. B. *Modern Shoe Manufacture.* American Society of Mechanical Engineers, New York, 1913.

HANSON, WILLIAM C., and WALCOTT, WILLIAM W. *Hygiene of the Boot and Shoe Industry in Massachusetts.* State Board of Health, Boston, 1912.

A scientific study of health conditions in the Massachusetts shoe factories.

JÖRISSEN, DR. FRANZ. *Die Deutsche Leder- und Lederwaren Industrie.* Text dreisprächig: deutsch, englisch, französisch. Druck und Verlag: Vereinigte Verlagsanstalten Gustav Braunbek und Guten Verg-Druckerei Akt.-Ges., Berlin, 1909.

An exhaustive and illustrated study of the leather and leather goods industries in Germany. Printed in three languages, German, English, and French, in parallel arrangement.

Nichols, Fred Hammond, Compiler. *The Building of a Shoe.* Thos. P. Nichols and Son Co., Lynn, Mass., 1912.

A series of chapters written by experts upon the departments and features of shoe manufacture.

Plucknett, Frank. *Introduction to the Theory and Practice of Boot and Shoe Manufacture.* Longmans, London, 1916.

A technical study of boot and shoe manufacture in English factories.

Rogers and Atwood Publishing Company. *American Shoemaking Directory.* Published by the Rogers and Atwood Publishing Co., Boston, Annual.

United Shoe Machinery Corporation. *The Footwear of Soldiers.* Published by the United Shoe Machinery Corporation, Boston, 1914.

Illustrations, with brief description, of the footwear worn by the soldiers of all countries.

Goodyear Welt Shoes: How They Are Made. Published by the United Shoe Machinery Corporation, Boston, 1918.

A pamphlet describing in detail the manufacture of Goodyear welt shoes.

A Primer of Boots and Shoes. Published by the United Shoe Machinery Corporation, Boston, 1914.

A brief historical account of the development of shoemaking.

Shoemaking Journals

American Review of Shoes and Leather. Philadelphia.
American Shoemaking, weekly. Boston.
Boot and Shoe Recorder, weekly. Boston.
Coast Shoe Reporter, monthly. San Francisco.
Hide and Leather, weekly. Chicago.
Shoe and Leather Facts, monthly. Philadelphia.
Shoe and Leather Reporter, weekly. Boston.
Shoe Findings. Chicago.
Shoe Repairer and Dealer, monthly. Boston.
Shoe Retailer, weekly. Boston.
Shoe Topics, weekly. Boston.
Superintendent and Foreman, weekly. Boston.
Weekly Bulletin of Leather and Shoe News. Bellows Falls, Vt.

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